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ABSTRACT

Developed as part of a larger project to revise the total agricultural education curriculum in South Carolina, this curriculum guide for a 2-year ornamental horticulture course contains six functional units, each with several sub-units, and six horizontal supportive units. Each unit includes behavioral objectives, learning activities, topic outline of content, and list of resources. The six supportive units are Orientation; Horticultural Mechanics (General Shop, Construction and Maintenance Skills, Using A Transit, Machinery Operation and Maintenance, Small Gasoline Engines, Machinery and Equipment Maintenance, and Engine Trouble Shooting and Repair); Basic Plant Science; Basic Soils; Basic Pest Control; and Identifying Ornamental Plants. The six functional units and their subunits are Nursery Production (Exploring Career Opportunities); Greenhouse Crop Productions (Growing a Fall Crop, Growing a Winter Crop, Growing a Spring Crop, and Exploring Career opportunities); Turfgrass Establishment and Maintenance (Turfgrass Establishment, Turfgrass Maintenance, and Exploring Career Opportunities); Landscape Design (Exploring Career Opportunities); Landscape Establishment and Maintenance (Exploring Career Opportunities); and Flower Shop and Garden Center Operation and Management (Retail Flower Shop and Operation and Management, Garden Center Operation and Management, Basic Sales, and Exploring Career Opportunities). An equipment list, a selected list of professional and technical societies and organizations concerned with ornamental horticulture and its applications, and a bibliography are appended. (HD)

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Ornamental Horticulture

A Curriculum Guide

Preliminary Draft

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Foreword

This curriculum guide was developed as a part of a larger project to revise the total agricultural education curriculum in South Carolina. The project was designed to implement the following changes:

- provide a more comprehensive vocational offering
- place a greater emphasis on behavioral objectives
- place a greater emphasis on learning activities
- encourage an inductive approach to teaching
- result in the re-identification of the units of instruction

Units of instruction for each course were developed which include behaviorally stated objectives, suggested learning activities, a topic outline, and suggested resources.

Frank R. Stover, State Supervisor
Agricultural Education

Acknowledgements

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The development of this guide was coordinated by Mr. Hugh P. McClimon, District Consultant of Agricultural Education.

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Rationale for the Course

An innate desire to create a pleasant environment, an affluent society, a rapidly expanding population, and man's inherent desire to grow plants have made ornamental horticulture a large industry in the United States. Millions of dollars are spent each year by individuals and institutions for ornamental plants. According to the 1969 United States Census of Agriculture, the sales of horticultural specialties was nearly 1 billion dollars in 1970 and approximately 98,000 people were employed in the production of such crops.*

In South Carolina almost every town, even very small towns, have at least one retail flower shop and many have a nursery or greenhouse operation. Larger towns usually have several flowershops, nurseries, greenhouses or golf courses. They also have businesses offering services in landscape design, establishment, maintenance and horticulture.

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* United States Department of Commerce, Bureau of Census, *1969 Census of Agriculture*, part 10 - Horticultural Specialties, p. 33.

According to a recent estimate the number of people employed in ornamental horticulture in the state is as follows:**

Retail Florists	1,350 Persons
Turf Areas (Golf courses, cemeteries, etc.)	2,380 Persons
Nurseries and Maintenance	1,400 Persons
Greenhouse Operations	400 Persons
	5,530 Persons

Increased mechanization and technological development in ornamental horticulture demand better trained personnel to work in this area. Many schools in South Carolina currently offer courses in ornamental horticulture. It is hoped that this guide will help teachers expand and improve their efforts in this field.

** Estimate by Mr. J. P. Fulmer, Associate Professor of Horticulture Extension Service, Clemson University, Clemson, S. C. September 6, 1974.

Use of the Guide

This guide is not a textbook. It is, as entitled, a curriculum guide. It is not designed to provide content, but to refer to content. It is designed to ask the prior questions - what should be taught and to some degree how and with what resources. The objectives are not behavioral in the truest sense - they may be closer to goals. Hopefully they help spell out the expected outcomes of the course. It was felt that the teachers of the course can determine the "givens" of the objectives and set their own "performance standards" as needed for a particular class or individual.

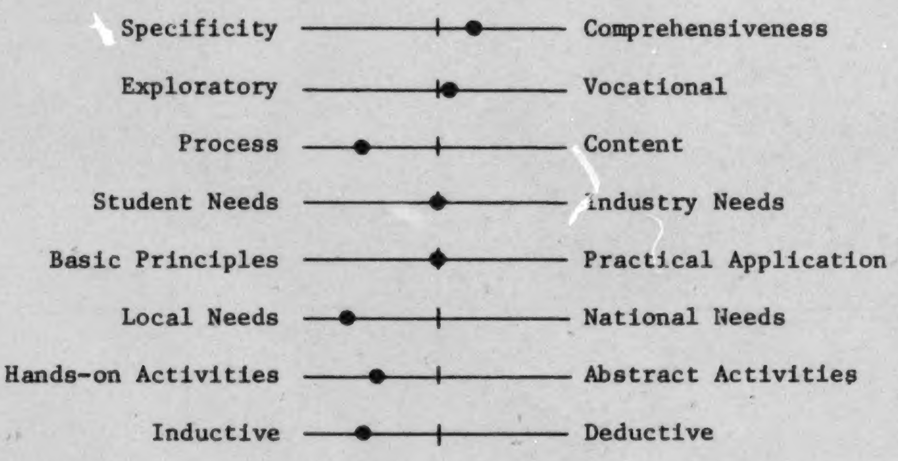
The general framework of the course is problem solving. To this degree, it is a functional approach. Hopefully, most units will be taught inductively, i. e., the teacher will begin with a practical problem or project and back up to basic pinciples. It is also hoped that most of the learning activities will be "hands-on" type activities although the importance of vicarious learning is recognized.

This curriculum guide was designed for a two year course. No special sequence is recommended. However, the order in which the guide is assembled offers one alternative. The horizontal supportive units (except for Horticultural Mechanics) and the three functional units to the left of the curriculum paradigm (p. 7) might be taught the first year. The three functional units on the right might be taught during the second year. Horticultural Mechanics might be taught exclusively in the second year or divided between the first and second year.

Please note that the paradigm used is a suggested format for the state. Local conditions may require the different time allocations. For example, if there are no retail flower shops in the community and no students expressing an interest in this area, the unit might be eliminated entirely or only selected objectives chosen.

Curriculum Framework

The designers used the following continuums to frame their thinking as they constructed these courses. Their biases are indicated below. For example, the designers felt that at the high school level they would prefer comprehensiveness to specificity. Therefore the dot is placed on the side of the continuum labeled comprehensiveness.



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UNIT: Orientation to Occupations in Ornamental Horticulture

SUB-UNIT:

OBJECTIVE(S): The student will be able to:

I. Describe in outline form the course in Occupations in Ornamental Horticulture.

II. Prepare in outline form a plan for integrating the FFA program and the course.

III. Prepare in outline form a supervised practice program which will enrich the course.

IV. Plan an occupational work experience program to complement the course in Occupations in Ornamental Horticulture.

V. Prepare a plan for exploring careers in Occupations in Ornamental Horticulture.

VI. ....

UNIT: Orientation to Occupations in Ornamental Horticulture
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
I. Describe in outline form the course in Occupations in Ornamental Horticulture. A. List the major objective(s) of each unit. B. List the major learning activity(s) to be accomplished in each unit. C. List the major topic(s) to be covered in each unit. D. List the major resources to be used in each unit. E.	I. Assign a committee to each of the major units and have them critique the unit and report their results to the class with suggestions for change. . Observe a presentation by the instructor of the course model via overhead projection. . ....
II. Prepare in outline form a plan for integrating the FFA program into the course in occupations in ornamental horticulture. A. List possible home or community improvement activities involving ornamental horticulture which could become projects for FFA. B. List ornamental horticulture projects suitable as part of the BOAC program. C. List some of the possible radio or TV programs that could be built around ornamental horticulture activities. D. List some of the team contests that are related to the course. E. List some of the individual contests related to the course. F.	II. Prepare a list of proposed projects involving ornamental horticulture which fits the FFA program of work. . Enter FFA contests related to ornamental horticulture. . Prepare radio or TV programs concerning improvement projects related to ornamental horticulture in the local community. . ....

UNIT: Orientation to Occupations in Ornamental Horticulture
SUB-UNIT:

TOPICS	RESOURCES
I. Occupations in ornamental horticulture course	I. The curriculum guide.
A. Objectives	
B. Learning activities	
C. Topics	
D. Resources, facilities and equipment	
E.	
II. FFA as an integral part of the course	II. Bender, et al. The FFA and You.
A. Committee projects relating to ornamental horticulture.	
B. BOAC programs which involve ornamental horticulture.	
C. Contests relating to the course . Team . Individual	
D. FFA summer camp	
E. TV and radio program projects	
F.	

UNIT: Orientation to Occupations in Ornamental Horticulture

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
III. Prepare in outline form a supervised practice program which will enrich if not form the core of the course.	III. Conduct a home production project related to occupations involving ornamental horticulture.
A. List at least two possible home production projects.	. Perform a supplemental home or farm job ralated to occupations in ornamental horticulture, e.g., planting ornamental trees.
B. List at least two possible home improvement projects related to improving the home landscape.	. Perform an improvement project related to forestry e.g., establish a fire lane.
C. List at least two supplementary farm jobs involving ornamental horticulture.	
D.	
IV. Plan an occupational work experience program to complement the course in occupations in ornamental horticulture.	IV. Make plans for and/or obtain a part-time job related to occupations in ornamental horticulture which will help prepare for a future career.
A. List at least ____ work stations in your community which would provide training in occupations related to the course.	. Prepare a work schedule for a chosen work station.
B. Prepare a brief work schedule for occupational work experience at one such station.	. ....
C.	
V. Prepare a brief plan for exploring careers in ornamental horticultural occupations.	V. Ask for an interview with your guidance counselor to discuss your strengths and weaknesses.
A. List at least ____ tests which can be used to analyze personal strengths and weaknesses.	. As a class project, try to set up a list of guidelines for evaluating careers as each career area is explored during the course.
B. List at least ____ criteria for evaluating careers.	. ....
VI.	VI. ....

UNIT: Orientation to Occupations in Ornamental Horticulture
SUB-UNIT:

TOPICS	RESOURCES
III. Integration of the supervised practice program into the course. A. Productive projects B. Home improvement projects C. Supplementary farm jobs D.	III. Miller. *Supervised Practice in Vocational Agriculture*.
IV. Occupational work experience in forestry. A. Locating work experience stations B. Job schedules C.	IV. Binkley. *Experience Programs for Learning Vocations in Agriculture*. . Fuller. *Education for Agricultural Occupations*. . Hoover. *Handbook of Agricultural Occupations*.
V. Career explorations A. Personal assessment . aptitudes . skills . attitudes . general competencies B. Criteria for career evaluation C.	V. Hoover. *Handbook of Agricultural Occupations*, Chapter 11.
VI.	VI. ....

RESOURCES

UNIT: Orientation to Occupations in Ornamental Horticulture
SUB-UNIT: Exploring Careers

BOOKS

Bender, Ralph E.; Clark, Raymond and Taylor, Robert E. *The FFA and You.* Danville, ILL: The Interstate Printers and Publishers, Inc. 1962.

Binkley, Harold and Hammonds, Carsie. *Experience Programs for Learning Vocations in Agriculture*. Danville, ILL: The Interstate Printers and Publishers, Inc., 1970.

Byram, Harold M. *Guidance in Agricultural Education*, Danville, ILL: The Interstate Printers and Publishers, Inc.

Fuller, Gerald R. *Education for Agricultural Occupations*. Danville, ILL: The Interstate Printers and Publishers, Inc.

Hoover, Norman K. *Handbook of Agricultural Occupations*. Danville, ILL: The Interstate Printers and Publishers, Inc., 2nd edition, 1969.

Miller, Texton R. *Supervised Practice in Vocational Agriculture*. Danville, ILL: The Interstate Printers and Publishers, Inc.

FILMS AND FILMSTRIPS

TRANSPARENCIES

UNIT: General Shop*

SUB–UNIT:

OBJECTIVE(S): The student will be able to:

I. Demonstrate the ability to perform general shop skills

II. ....

*If the instructor feels that this unit is needed, it is available in any of the following curriculum guides:

Agricultural Mechanics
Forestry Occupations
Harvesting Pulpwood
Agricultural Production and Business Management Vol. I & II

UNIT: Horticultural Mechanics

SUB-UNIT: Construction and Maintenance Skills

OBJECTIVE(S): The student will be able to:

I. Demonstrate the ability to perform selected construction tasks.

II. Demonstrate the ability to perform selected plumbing tasks.

III. Demonstrate the ability to perform selected electrical wiring tasks.

IV. ....

UNIT: Horticultural Mechanics
SUB-UNIT: Construction and Maintenance Skills

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Demonstrate the ability to perform selected construction tasks.	I. Observe demonstrations of and practice performing selected elementary construction.
A. Plan and construct a typical walk or patio.	A. Observe demonstrations of and practice constructing a small concrete walk or patio.
1. Calculate within ±5% the amount of concrete needed.	. Practice calculating the amount of concrete needed to pour a given area.
2. List the amount and kind of ingredient or materials needed.	. ....
3.	
B. When given the necessary tools and materials, construct a corner using masonry blocks. The corner should be straight, square and plumb.	B. Observe demonstrations of and practice constructing a typical building corner using masonry blocks.
1. Select a recommended block pattern.	1. Observe demonstrations of and practice preparing a mortar mix.
2. Prepare a recommended mortar.	. Observe demonstrations of and practice using a plumb line.
3. Demonstrate the correct use of a plumb line.	. ....
4.	

UNIT: Horticultural Mechanics
SUB-UNIT: Construction and Maintenance Skills

TOPICS	RESOURCES
I. Performing selected construction tasks	I. Wakeman/McCoy. The Farm Shop, chapter 14.
A. Constructing a concrete slab	A. Wakeman/McCoy. The Farm Shop, chapter 14.
1. Calculating amount needed	. ....
2. Selecting ingredients	
3.	
B. Constructing a building corner using masonry blocks	B. Wakeman/McCoy. The Farm Shop, chapter 14.
1. Selecting the block pattern	
. Preparing a mortar mix	
. Using the plumb line	
. ....	

UNIT: Horticultural Mechanics
SUB-UNIT: Construction and Maintenance Skills

OBJECTIVES	LEARNING ACTIVITIES
C. Perform selected basic tasks required in constructing a small wood frame building	C. Observe demonstrations of and practice framing a small wood frame building or parts of such a building.
1. Lay out a small building such that each corner is square.	1. Observe demonstrations of or practice squaring the corners of a building.
2. Square a board.	2. Observe demonstrations of or practice squaring a board.
3. Cut a common, hip or valley and jack rafter.	3. Observe demonstrations of or practice cutting a common, hip or valley and jack rafter.
4. Frame a typical door.	4. Observe demonstrations of or practice framing a typical door.
5. Frame a typical window.	5. Observe demonstrations of and/or frame a typical window.
6.	6. ....
D.	D. ....

UNIT: Horticultural Skills
SUB-UNIT: Construction and Maintenance Skills

TOPICS	RESOURCES

C. Performing selected tasks used in constructing a small wood frame building.
. Laying out a small building
. Squaring a board
. Cutting rafters
  . Common
  . Hip or valley
  . Jack
  . ....
. Framing a door
. Framing a window
. ....
	C. Wakeman/McCoy. *The Farm Shop*, chapter 9.

D.	

UNIT: Horticultural Mechanics
SUB-UNIT: Construction and Maintenance Skills

OBJECTIVES	LEARNING ACTIVITIES
II. Demonstrate the ability to perform selected plumbing tasks.	II. Observe demonstrations of and practice performing selected plumbing tasks.
A. Compare and contrast the major types of piping materials, e.g., galvanized pipe, copper pipe, plastic pipe.	A. Prepare a list of advantages and disadvantages of each of the major types of pipe.
B. Identify the components of a typical water system.	B. Set up a small identification contest using plumbing components.
C. When given the necessary tools and materials, perform selected tasks required in constructing or repairing a water line using copper tubing.	C. Observe demonstrations of and practice setting up or repairing a water line using copper pipe.
1. When given the necessary tools, cut a copper pipe to a specified dimension.	1. Observe demonstrations of and practice cutting copper pipe.
2. When given the necessary tools and materials, join two pieces of pipe by soldering and sweating such that it does not leak under normal operating pressures.	2. Observe demonstrations of and practice joining copper pipe by soldering and sweating.
3. When given the necessary tools and equipment, bend a typical piece of copper pipe to a specified arc.	3. Observe demonstrations of and practice bending copper pipe.
4.	4. .....

UNIT: Horticultural Mechanics
SUB-UNIT: Construction and Maintenance Skills

TOPICS	RESOURCES
II. Performing selected plumbing tasks	II. AAVIM. Planning for an Individual Water System.
A. Selecting a type of pipe . Galvanized iron . Copper . Plastic	A. AAVIM. Planning for an Individual Water System.
B. Identifying water system components	B. AAVIM. Planning for an Individual Water System.
C. Constructing or repairing water systems made of copper piping.	C. Wakeman/McCoy. The Farm Shop, chapter 13.
1. Cutting copper pipe	. Phipps. Mechanics in Agriculture, chapter 34.
2. Joining copper pipe by soldering and sweating	. ....
3. Bending copper pipe	
4.	

UNIT: Horticultural Mechanics
SUB-UNIT: Construction and Maintenance Skills

OBJECTIVES	LEARNING ACTIVITIES
D. When given the necessary tools and materials, perform selected tasks required in constructing or repairing water systems made of galvanized iron pipe.	D. Observe demonstrations of and practice performing selected tasks required in constructing or repairing water systems made of galvanized pipe.
1. Select, adjust and safely use a hand operated pipe cutter.	1. Observe demonstrations of and practice using a hand pipe cutter.
2. Select, adjust and safely use a hand operated pipe reamer.	2. Observe demonstrations of and practice using a hand operated pipe reamer.
3. Select, adjust and safely operate a typical hand operated pipe threader	3. Observe demonstrations of and practice using a hand operated pipe threader.
4. Select an appropriate pipe die for threading a selected pipe.	4. Observe demonstrations of and practice selecting a recommended die for threading a pipe.
5. When given the necessary wrenches and materials, join two pieces of galvanized iron pipe using a coupling.	5. Observe demonstrations of and practice joining two pieces of galvanized pipe.
a. Select a recommended thread sealer (paste)	. ....
b. Select a recommended coupling.	
c.	

UNIT: Horticultural Mechanics
SUB-UNIT: Construction and Maintenance Skills

TOPICS	RESOURCES
D. Constructing or repairing water systems made of galvanized iron pipe.	D. Wakeman/McCoy. The Farm Shop, chapter 13.
1. Using the pipe cutter	. Phipps. Mechanics in Agriculture, chapter 34.
2. Using the pipe reamer	. ....
3. Using the pipe threader	
4. Selecting a pipe die	

UNIT: Horticultural Mechanics
SUB-UNIT: Construction and Maintenance Skills

OBJECTIVES	LEARNING ACTIVITIES
E. Repair a leaking faucet.	E. Observe a demonstration of and practice repairing a leaking faucet.
1. Ream the faucet seat	
2. Replace the faucet washer	
3.	
F. Construct an elementary greenhouse sprinkler system or a portion of such a system which includes the basic parts.	F. Observe demonstrations of and practice constructing an elementary sprinkler system.
1. Diagram the basic system.	. Prepare a diagram of a typical greenhouse sprinkler system.
2. Select the recommended components.	
3. Assemble the major components.	. Prepare a diagram illustrating the principle of a solenoid valve.
4. Diagram and/or otherwise describe the operating principle of a solenoid valve.	. ....
5.	
III. Demonstrate the ability to perform selected electrical wiring tasks frequently needed in ornamental horticulture occupations.	III. Observe demonstrations of and practice performing selected wiring tasks.
A. Replace an attachment plug in a manner recommended by the industry.	A. Observe demonstrations of and practice replacing attachment plugs.
B. Replace a service cord in a manner recommended by the industry.	B. Observe demonstrations of and practice replacing service cords.
C. Replace a fuse in a manner recommended by the industry.	C. Observe demonstrations of and practice replacing fuse.

UNIT: Horticultural Mechanics
SUB-UNIT: Construction and Maintenance Skills

TOPICS	RESOURCES
E. Repairing a leaking faucet	E. Phipps. *Mechanics in Agriculture*, p. 655.
. Reaming the faucet seat	. ....
. Replacing the faucet washer	
. ....	
F. Constructing an elementary greenhouse sprinkler system	F. ....
. Diagraming the system	
. Selecting components	
. Assembling the system	
. Principles of the solenoid valve	
. ....	
III. Perform selected electrical wiring tasks.	III. AAVIM. *Maintaining the Home Lighting and Wiring System*
A. Replacing attachment plugs	A. AAVIM. *Maintaining the Home Lighting and Wiring System*
B. Replacing service cords	B. AAVIM. *Maintaining the Home Lighting and Wiring System*
C. Replacing fuses	C. AAVIM. *Maintaining the Home Lighting and Wiring System*

UNIT: Horticultural Mechanics
SUB-UNIT: Construction and Maintenance Skills

OBJECTIVES	LEARNING ACTIVITIES
D. Replace a single pole and 3-way switch in a manner recommended by the industry.	D. Observe demonstrations of and practice replacing single pole and 3-way switches.
E. Replace a convenience outlet in a manner recommended by the industry.	E. Observe demonstrations of and practice replacing convenience outlets.
F. Replace a lamp socket in a manner recommended by the industry.	F. Observe demonstrations of and practice replacing lamp sockets.
G.	G. ....
IV.	IV. ....

UNIT: Horticultural Mechanics
SUB-UNIT: Construction and Maintenance Skills

TOPICS	RESOURCES
D. Replacing single pole and 3-way switches.	D. AAVIM. Maintaining the Home Lighting and Wiring System
E. Replacing convenience outlets	E. AAVIM. Maintaining the Home Lighting and Wiring System
F. Replacing lamp sockets.	F. AAVIM. Maintaining the Home Lighting and Wiring System
G.	G. ....
IV.	

RESOURCES

UNIT: Horticultural Mechanics
SUB-UNIT: Construction and Maintenance Skills

BOOKS

American Association for Vocational Instructional Materials. Athens, Ga:

- Maintaining the Home Lighting and Wiring System
- Planning Water Systems for Farm and Home

Phipps, Lloyd J. Mechanics in Agriculture, Danville Ill: The Interstate Printers and Publishers, 1967

Wakeman, T. J. and McCoy, Vernon Lee. The Farm Shop New York: The MacMillan Company, 1960.

FILMS AND FILMSTRIPS

BULLETINS

TRANSPARENCIES

UNIT: Horticultural Mechanics

SUB-UNIT: Using A Transit

OBJECTIVE(S): The student will be able to:

I. Layout a contour using a transit.

II. Determine slope using a transit.

III. Square corners using a transit.

IV. Determine evenness of a surface using a transit.

V. Layout a typical terrace.

VI. ....

UNIT: Horticultural Mechanics
SUB–UNIT: Using A Transit

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Layout a contour using a transit.	I. Observe demonstrations of and/or practice laying out contours using a transit. . ....
A. Level a transit.	A. Observe demonstrations of and/or practice leveling a transit.
B. Stake out a given contour line using a transit.	. Observe demonstrations of and/or practice staking out a contour using a transit. . Practice drawing a contour map to scale.
C.	
II. Determine a slope using a transit.	II. Observe a demonstration of and/or practice using a transit to determine slope. . ....
III. Square corners using a transit.	III. Observe a demonstration of and/or practice laying out square corners using a transit. . ....
IV. Determine evenness of a surface using a transit.	IV. Observe a demonstration of and/or determine the evenness (levelness) of a surface using a transit. . ....
V. Layout a typical terrace.	V. Observe a demonstration and/or layout a typical terrace.
VI.	VI. ....

UNIT: Horticultural Mechanics
SUB-UNIT: Using A Transit

TOPICS	RESOURCES
I. Measurement of linear distance a. breaking tape - (measurements of horizontal distance on slopes) b. temperature correction c. incorrect tape length correction	I. University of Missouri. Soil Erosion and Sediment Pollution Control. p. 71. . Breed. Surveying. . Brinker. Elementary Surveying. . Davis and Kelley. Surveying Theory and Practice. . Kissam. Surveying Practice.
II. Introduction to the level a. level care b. level knobs c. leveling the level head d. reading the level rod e. setting the level fieldnotes f. small level net field project	II. See above references.
III. Introduction to transit a. transit care b. transit knobs and adjustments c. setting up the transit d. reading the vernier e. turning deflection angles f. reading compass g. calculating bearings from deflection angles h. measurement of slope and vertical angles i. D.M.D. j. stadia	III. See above references.
IV. Leveling a surface	IV. See above references.
V. Laying out a typical terrace	V. University of Missouri. Soil Erosion and Sediment Pollution Control. p. 163.
VI.	VI. ....

RESOURCES

UNIT: Horticultural Mechanics

SUB-UNIT: Using A Transit

BOOKS

Beasley, R.P. Soil Conservation and Sediment Pollution Control. Columbia, Missouri: Instructional Materials Laboratory, University of Missouri, 1973.

Breed, Charles B. Surveying. New York: J. Wiley and Sons, Inc., 1942.

Brinker, Russell C. Elementary Surveying, Scranton, PA: International Textbook Co., 1970.

Davis, Raymond E. and Kelley, Joe W. Elementary Plane Surveying. New York: McGraw-Hill, 1967.

Kissam, Phillip. Surveying Practice. New York: McGraw-Hill, 2nd ed., 1971.

FILMS AND FILM STRIPS

BULLETINS

TRANSPARENCIES

UNIT: Horticultural Mechanics

SUB-UNIT: Machinery Operation and Maintenance

OBJECTIVE(S): The student will be able to:

I. Select, adjust, safely operate and maintain selected horticultural machinery or equipment in a manner commensurate with industry standards.

II. ....

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UNIT: Horticultural Mechanics
SUB-UNIT: Machinery Operation and Maintenance

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Select, adjust, safely operate and maintain selected horticultural machinery or equipment in a manner commensurate with industry standards.	I. Observe demonstrations of and practice selecting, adjusting, operating and maintaining horticultural equipment.
A. Select, adjust, safely operate and maintain machinery or equipment commonly used in nursery production.	A. Observe demonstrations of and practice selecting, adjusting, operating and maintaining horticultural machinery and equipment used in nursery production.
1. Select, adjust, safely operate and maintain tractors used for horticultural work.	1. Observe demonstrations of and practice selecting, adjusting, operating and maintaining tractors used for horticultural work.
2. Select, adjust, safely operate and maintain tractor implements used to plant, cultivate or harvest nursery crops.	2. Observe demonstrations of and practice adjusting, operating and maintaining tractor implements used to plant, cultivate or harvest horticultural crops.
a. Select, adjust, safely operate and maintain a tree digger.	a. Observe demonstrations of and practice adjusting, operating, and maintaining a tree digger.
b. Select, adjust, safely operate and maintain tractor plows, disks, sprayers, cultivators, etc.	b. Observe demonstrations of and practice adjusting, operating and maintaining plows, disks, sprayers, cultivators, etc.
c.	c. ....
3. Select, adjust, safely operate and maintain typical irrigation systems used for watering nursery crops.	3. Observe demonstrations of and practice adjusting, operating and maintaining irrigation systems used for watering nursery crops.

UNIT: Horticultural Mechanics
SUB-UNIT: Machinery Operation and Maintenance

TOPICS	RESOURCES
I. Selecting, adjusting, operating and maintaining horticultural machinery and equipment.	I. AAVIM. Operating Tractors for Grounds Keeping and Ornamental Horticulture.
	. AAVIM. Planning for an Irrigation System.
A. Nursery machinery and equipment	. Equipment manufacturers' manuals
1. Tractors	. Hawker/Keenlyside. Horticultural Machinery.
2. Tractor implements	. ....
a. Tree diggers	A. AAVIM. Operating Tractors for Grounds Keeping and Ornamental Horticulture
b. Others . plows . disks . cultivators . sprayers	. AAVIM. Planning for an Irrigation System . Manufacturers' Manuals. . Hawker/Keenlyside. Horticultural Machinery. . ....
c.	
3. Irrigation systems	

UNIT: Horticultural Mechanics
SUB-UNIT: Machinery Operation and Maintenance

OBJECTIVES	LEARNING ACTIVITIES
B. Select, adjust, safely operate and maintain machinery or equipment used mainly in greenhouse production.	B. Observe demonstrations of and practice adjusting, operating and maintaining equipment used mainly in greenhouse production.
1. Select, adjust, safely operate and maintain a typical greenhouse heating and/or cooling system.	1. Observe demonstrations of and practice adjusting, operating and maintaining a typical greenhouse heating or cooling system.
a. List the major principles of heating or cooling involved.	
b. Identify the major controls.	
c.	
2. Select, adjust, safely operate and maintain a typical CO_2 generator.	2. Observe demonstrations of and practice adjusting, operating and maintaining a typical CO_2 generator.
3. Select, adjust, safely operate and maintain a typical soil sterilizer.	3. Observe demonstrations of and practice adjusting, operating and maintaining a typical soil sterilizer.
4. Select, adjust, safely operate and maintain a selected greenhouse watering system	4. Observe demonstrations of and practice adjusting, operating and maintaining a typical greenhouse watering system.
a. List the major types of watering systems used.	
b. Compare and contrast the effectiveness of a selected system for a given operation.	
c.	
5.	5. ....

UNIT: Horticultural Mechanics
SUB-UNIT: Machinery Operation and Maintenance

TOPICS	RESOURCES
B. Greenhouse production equipment	B. Manufacturers' manuals
1. Heating and cooling systems	1. Manufacturers' manuals
. Basic principles	
. Control identification	
. ....	
2. CO_2 generator	2. Manufacturers' manuals
3. Soil sterilizers	3. Manufacturers' manuals
4. Greenhouse watering systems	4. Manufacturers' manuals
. Types	
. Type comparison	
. ....	
5.	5. ....

UNIT: Horticultural Mechanics

SUB-UNIT: Machinery Operation and Maintenance

OBJECTIVES	LEARNING ACTIVITIES
C. Select, adjust, safely operate and maintain machinery or equipment used mainly in turfgrass establishment or maintenance.	C. Observe demonstrations of and practice adjusting, operating and maintaining equipment used mainly in turfgrass establishment and maintenance.
1. Select, adjust, safely operate and maintain, verticutters, thatch removal equipment, mowers (reel, vertical, gang, rotary), and aeration equipment.	1. Observe demonstrations of and practice adjusting, operating and maintaining verticutters, thatch removal equipment, mowers (reel, vertical, gang and rotary) and aeration equipment.
2. Select, adjust, safely operate and maintain commonly used land preparation equipment, e.g., tractors and implements - disks, plows, etc.	2. Observe demonstrations of and practice adjusting, operating and maintaining land preparation equipment used in turf establishment, e.g., tractors and implements - disks, plows, etc.
3. Select, adjust, safely operate and maintain irrigation systems commonly used in turfgrass establishment and maintenance.	3. Observe demonstrations of and practice adjusting, operating and maintaining irrigation systems commonly used in turfgrass establishment and maintenance.
4.	4. ....

UNIT: Horticultural Mechanics
SUB-UNIT: Machinery Operation and Maintenance

TOPICS	RESOURCES
C. Selecting, adjusting,operating and maintaining turf grass machinery and equipment.	C. Hawker/Keenlyside. *Horticultural Machinery.* . Manufacturers' manuals.

1. Turf equipment
. Verticutter
. Thatch removal
. Mowers
  . reel
  . vertical
  . gang
  . rotary
. Aeration
. ....
	1. Hawker/Keenlyside. *Horticultural Machinery*.
	. Manufacturers' manuals

2. Land preparation equipment . Disks . Plows . Harrows . Spreaders	2. Hawker/Keenlyside. *Horticultural Machinery* . Manufacturers' manuals

3. Irrigation systems for turf and lawns
. Lawns
  . Above ground
  . Below ground
  . ....
. Athletic fields
. Golf courses
  . Tees
  . Greens
  . Fairways
. ....
	3. AAVIM. *Planning for an Irrigation System*.

UNIT: Horticultural Mechanics
SUB-UNIT: Machinery Operation and Maintenance

OBJECTIVES	LEARNING ACTIVITIES
D. Select, adjust, safely operate and maintain machinery and equipment commonly used on landscape establishment.	D. Observe demonstrations of and practice adjusting, operating and maintaining machinery and equipment commonly used in landscape establishment.
1. Select, adjust, safely operate and maintain a power operated hole digger.	1. Observe demonstrations of and practice adjusting, operating and maintaining a typical hole digger.
2. Select, adjust, safely operate and maintain a power operated soil shredder or mixer.	2. Oberve demonstrations of and practice adjusting, operating and maintaining a typical soil shredder.
3.	3. ....
E.	E. ....
II.	II. ....

UNIT: Horticultural Mechanics
SUB-UNIT: Machinery Operation and Maintenance

TOPICS	RESOURCES
D. Selecting, adjusting, operating and maintaining machinery and equipment commonly used in landscape establishment	D. Hawker/Keenlyside. *Horticultural Machinery*. . Manufacturer's manuals
1. Power operated hole-diggers	
2. Soil shredders or mixers	
3.	
E.	E. ....
II.	II. ....

RESOURCES

UNIT: Horticultural Mechanics
SUB-UNIT: Machinery Operation and Maintenance

BOOKS

American Association for Vocational Instructional Materials. Athens, Ga.:
- Planning an Irrigation System
- Operating Tractors for Grounds Keeping and Ornamental Horticulture

Hawker, MFJ. and Keenlyside, J.F. Horticultural Machinery, London. MacDonald, Technical and Scientific, 1971.

FILMS AND FILMSTRIPS

American Association for Vocational Instructional Materials, Athens, Ga.

Slides: Planning for an Irrigation System

BULLETINS

TRANSPARENCIES

UNIT: Horticultural Mechanics

SUB-UNIT: Small Gasoline Engines*

OBJECTIVE(S): The student will be able to:

I. Select an appropriate engine for a given purpose.

II. Show by diagrams the principles of the small gasoline engine and its major systems.

III. Disassemble, identify worn parts, repair or replace such parts and reassemble each of the major systems of a typical small gasoline engine.

IV. Tune a typical small gasoline engine.

V. ....

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* If the instructor feels that this unit is needed, see the following curriculum guides:

Agricultural Mechanics
Forestry Occupations
Harvesting Pulpwood
Agricultural Production and Business Management Volume I

UNIT: Horticultural Mechanics

SUB-UNIT: Machinery and Equipment Maintenance

OBJECTIVE(S): The student will be able to:

I. Plan a maintenance program for the machinery and equipment used in a given horticultural operation.

- A. Plan a lubrication schedule for a given piece of machinery or equipment.
- B. Select an appropriate lubricant for a given piece of machinery or equipment.
- C. Perform the major tasks involved in a typical lubrication program.
- D. Prepare a checklist and schedule of miscellaneous maintenance for a given piece of machinery or equipment.
- E. ....

II. ....

UNIT: Horticultural Mechanics
SUB-UNIT: Machinery and Equipment Maintenance

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Plan a maintenance program for the machinery and equipment used in a given horticultural operation.	I. As a class, small group or individual project, plan a maintenance program for a local horticultural operation. . Ask a nurseryman to discuss his machinery and equipment maintenance program.
A. Plan a lubrication schedule for a given machine or piece of equipment under given use conditions.	A. Individually or in small groups plan a lubrication program for a machine or piece of equipment
1. Prepare a lubrication schedule for a selected machine, e.g., mowers, verticutters, aerators, etc.	. Obtain and use a manufacturer's lubrication schedule for lubricating a machine or piece of equipment.
2. Prepare a lubrication schedule for mowers under given use conditions.	. ....
3. Prepare a lubrication schedule for tractors under given use conditions.	
4. Obtain and interpret the manufacturer's lubrication schedule for a given vehicle or piece of equipment.	
5.	
B. Select an appropriate lubricant for a given use.	B. Obtain various greases and oils and compare them as to viscosity, etc.
1. List the major functions of a lubricant, e.g., cushion, seal, reduce friction, etc.	. Observe or perform demonstrations of the cushioning friction reduction, sealing, etc., effects of oil. . Make some "homemade" grease using soap and oil. . Obtain oil cans and practice determining government classifications.

UNIT: Horticultural Mechanics
SUB-UNIT: Machinery and Equipment Maintenance

TOPICS	RESOURCES
I. Preventive Maintenance	I. AAVIM. Tractor Maintenance. . AAVIM. Farm Tractor Tune-up Specifications. . Manufacturer's lubrication guides . Local agricultural machinery mechanics . Grounds Keeping Equipment, Vol. I. (Operating tractors for grounds keeping in ornamental horticulture) . ....
A. Planning a lubrication schedule 1. Machinery . Mowers . Tractors . Land preparation equipment . Sprayers . Soil mixers . Hole diggers . .... 2. Equipment	
B. Lubricant selection 1. Functions of lubricants a. Sealing b. Friction reduction c. Cushioning d. Cleaning e. Cooling f.	B. AAVIM. Selecting and Storing Tractor Fuels and Lubricants. . Deere & Co. Fundamentals of Service Fuels, Lubricants and Coolant. . American Petroleum Institute. . Slides: AAVIM. Selecting and Storing Tractor Fuels and Lubricants.

UNIT: Horticultural Mechanics
SUB-UNIT: Machinery and Equipment Maintenance

OBJECTIVES	LEARNING ACTIVITIES
2. Compare and contrast lubricants. a. Differentiate between an oil and a grease. b. List the major oil classification. c. List at least 4 types of greases. d. Interpret a label to determine oil classification. e. .... 3. When given a specific bearing select the type of oil or grease needed. 4.	. Using a manufacturer's guide to lubrication, try to explain the reasons for different greases and oils for different bearings and other surfaces to be lubricated. . ....
C. Perform the major tasks involved in a lubrication program. 1. Locate point of lubrication on a given vehicle or piece of equipment. a. Locate grease fittings. b. Locate oil parts. c. Transmission entrance. d. .... 2. Select an appropriate means of greasing or adding oil. 3. Operate a grease gun. 4. Demonstrate the ability to correctly grease a fitting. 5. Check the oil level in an engine. 6.	C. Practice greasing a machine or piece of equipment using a grease gun. . Observe demonstrations of and/or practice loading a grease gun. . Practice locating fittings to be greased and oil entrance on a machine or piece of equipment. . ....

UNIT: Horticultural Mechanics
SUB-UNIT: Machinery and Equipment Maintenance

TOPICS	RESOURCES
2. Lubricant classification a. Types of greases . Water pump grease . Ball-and-roller bearing grease . Pressure gun grease . All-purpose grease . Multipurpose grease . .... b. Oils . Gear . Transmission . Hydraulics . Crank case . Weights-10-20-30 . A.P.I. classifications M., MM, MS, DG	
C. Lubrication 1. Locating lubrication points . Locating fittings . Locating oil parts . .... 2. Selecting equipment 3. Operating grease guns 4. Checking oil level 5.	C. AAVIM. Tractor Maintenance. . Local service station operators. . Local agricultural equipment maintenance shop mechanics. . Manufacturer's lubrication guides. . ....

UNIT: Horticultural Mechanics

SUB-UNIT: Machinery and Equipment Maintenance

OBJECTIVES	LEARNING ACTIVITIES
D. Prepare a maintenance checklist and schedule of miscellaneous items for a given piece of machinery or equipment, e.g., air filter change, water level, tire inflation, etc.	D. As a small group or individual class assignment prepare a miscellaneous maintenance checklist and schedule for a machine or piece of equipment.
1. Perform the more common miscellaneous maintenance items. a. Change an air cleaner filter. b. Check tire inflation. c. Check fan belts on engines. d.	. ....
2. Interpret a manufacturer's checklist or schedule of miscellaneous maintenance.	. Obtain and use a manufacturer's checklist of miscellaneous maintenance.
3. ...	
E. ...	E. ....
II.	II.

UNIT: Horticultural Mechanics
SUB-UNIT: Machinery and Equipment Maintenance

TOPICS	RESOURCES
D. Miscellaneous maintenance checklist 1. Vehicles a. Electrical System . Battery Distributor . Wiring . .... b. Cooling . Fan belt . Coolant level . Radiator . .... c. Carburetion . Gas lines . Carburetor sediment bowl . ... d. Air cleaner . Air cleaner element . Hoses . .... e. Tires f. Brakes g. Steering h. Hydraulic system i. ... 2. Equipment a. Chain saw . Chain wear . .... b. .... 3.	D. AAVIM. Tractor Maintenance. . AAVIM. Tractor Operation and Daily Care. . Local agricultural equipment maintenance shop mechanics . Manufacturer's maintenance or service guides . Slides: AAVIM. Tractor Maintenance. . Slides: AAVIM. Tractor Operation and Daily Care. . ....
E.	E. ....
II.	II. ...

RESOURCES

UNIT: Horticultural Mechanics

SUB-UNIT: Machinery and Equipment Maintenance

BOOKS

American Association for Vocational Instructional Materials. *Selecting and Storing Tractor Fuels and Lubricant*. Athens, Georgia: The Association, 1964.

American Association for Vocational Instructional Materials. *Tractor Maintenance*. Athens, GA: The Association, 1964.

American Association for Vocational Instructional Materials. *Tractor Operation and Daily Care*. Athens, GA: The Association, 1967.

American Association for Vocational Instructional Materials. *Farm Tune-up and Service Specifications*. Athens, GA: The Association, 1972.

Deere and Co. *Fundamentals of Service Fuels, Lubricants and Coolants*. Moline, Illinois: Deere and Company, 1970.

FILMS AND FILM STRIPS

Slides: American Association for Vocational Instructional Materials, Athens, GA.

1. *Selecting and Storing Tractor Fuel and Lubricants*
2. *Tractor Maintenance*
3. *Tractor Operation and Daily Care*

BULLETINS

TRANSPARENCIES

UNIT: Horticultural Mechanics*

SUB-UNIT: Engine Trouble Shooting and Repair

OBJECTIVE(S): The student will be able to:

I. When given an engine with a more common malfunction, identify the system in which the malfunction has occurred.

II. When given the necessary tools and equipment, disassemble a given system, identify malfunctioning or worn parts, repair or replace such parts, reassemble and adjust the system.

III. ....

*If the instructor feels that this unit is needed, see the following curriculum guides:

Agricultural Production and Business Management, Volume I
Forestry Occupations
Harvesting Pulpwood

UNIT: Basic Principles of Plant Science

OBJECTIVE(S): The student will be able to:

I. Classify a plant according to its life cycle and botanical class.

II. Identify the major parts of a typical plant and describe the function of each part.

III. Describe in writing and/or by drawing the reproductive system of a typical plant.

IV. Explain in writing and/or by diagram the basic processes of plant growth.

V. State the major functions of the elements essential for plant growth.

VI. ....

UNIT: Basic Principles of Plant Science

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Classify a given plant according to its life cycle and botanical class.	I. As a class, small group or individual project, prepare a classification of the major crops grown in the local community. Add a life cycle or botanical classification.
A. When given descriptions of the three major life cycle classifications, correctly label each as an annual, biennial, or perennial.	. ....
B. List the major classifications of the plant kingdom.	
1. List the four major divisions of a phylum.	
2. List three divisions of the thallus phylum.	
3. List two classes of plants.	
4. List two major plant families.	
5. List at least two families of monocotyledons and two of dicotyledons.	
C. List the major identifying characteristic(s) of each of the major classifications.	
II. Identify the major parts of a typical plant and describe the function of each part.	II. Gather specimen plants and identify the major parts.
A. List the major structures (parts) of seed producing plants.	. Practice drawing and/or labeling plant parts
B. List the functions of the vegetative organs--leaves, stems and roots.	. Obtain specimen leaves of different types
	. Obtain and observe specimen roots of various types

UNIT: Basic Principles of Plant Science
SUB-UNIT:

TOPICS	RESOURCES
I. Plant classification A. Life cycle . Annuals . Biennials . Perennials B. Botanical . Kingdom . Phylum . Class . Order . Family . Genus . Species	I. Mississippi State University. A Reference Unit on Basic Principles of Plant Science. pp. 2-5. . VEMC. Plant Science Transparencies
II. Plant parts and functions of parts A. Major structures . Leaves . Stems . Roots . Flowers . Seeds or fruit B. Functions of vegetative organs . Leaves . Stems . Roots	II. Mississippi State University. A Reference Unit on Basic Principles of Plant Science. pp. 5-12. . VEMC. Plant Science Transparencies

UNIT: Basic Principles of Plant Science
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
C. List at least two kinds of roots. D. Describe in writing the process of absorption. E. Define in writing the following terms - geotropism, phototropism, thermotropism, thigmotropism and chemotropism. F.	. Observe a demonstration of and/or conduct a demonstration of the process of osmosis and diffusion using a container of water, a semi-permeable membrane and a salt . Observe demonstrations of the major plant processes . Observe demonstrations of tropism . ....

UNIT: Basic Principles of Plant Science
SUB-UNIT:

TOPICS	RESOURCES
C. Types of vegetative organs . Leaves . Simple . Compound . .... . Stems . Soft . Woody . Single woody . .... . Roots . Tip root system . Fibrous system . Primary . Secondary	. Mississippi State University. A Reference Unit on Plant Science. pp. 5-12. . VEMC. Plant Science Transparencies . ....
D. Absorption . Diffusion . Osmosis	
E. Tropism . Geotropism . Phototropism . Thermotropism . Thigmotropism . Chemotropism	
F.	F. ....

UNIT: Basic Principles of Plant Science
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
III. Describe in writing or by drawings the reproductive system of a typical plant.	III. Draw and label and/or label drawings of a typical plant reproductive system.
A. List at least three functions and/or uses of seed.	
B. Describe by writing or drawing the difference between the seed of an angiosperm and a gymnosperm.	· Collect and compare angiosperm and gymnosperm seeds
C. Draw and label the parts of a typical bean seed.	· Draw and label and/or label prepared drawings depicting the development of a bean seed
D. Describe by writing and/or drawing the three major stages in the development of an ovule into a seed.	· Draw and label and/or label prepared drawing depicting the development of an ovule into a seed
E. Describe in writing and/or by diagram the four major steps in the germination of a typical bean seed.	· Draw and label and/or label prepared drawings of the germination of a typical bean seed
	· Plant some bean seed and observe the day-to-day germination process
	· Draw and label and/or label prepared drawings depicting the formation of corn seed

UNIT: Basic Principles of Plant Science

SUB-UNIT:

TOPICS	RESOURCES
III. Plant reproduction A. Seed functions . Assure continued plant life . Provide food for man and animals . .... B. Types of seed . Angiosperm . Gymnosperm . .... C. Parts of a bean seed D. Development of the ovule . Integuments formation . Cell division and differentiation . . Cotyledons formation . . Plumule formation . . Hypocotyl formation . . Radicle formation . Stalk drop	III. Mississippi State University. A Reference Unit on Basic Principles of Plant Science. pp. 13-16. . VEMC. Plant Science Transparencies . ....
E. Steps in germination . Water and oxygen absorption . Root breaks through testa to soil . Hypocotyl forms and penetrates soil surface . Cotyledons open	. Mississippi State University. A Reference Unit on Basic Principles of Plant Science. pp. 15-21. . VEMC. Plant Science Transparencies . ....

UNIT: Basic Principles of Plant Science
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
F. Draw a typical cotton flower and label the parts.	- Draw and label and/or label prepared drawings of a cotton plant flower
G. Define the following terms: complete flower, incomplete flowers, perfect flowers, imperfect flowers, monoecious and dioecious.	- Obtain an actual cotton plant flower and practice identifying parts

UNIT: Basic Principles of Plant Science
SUB-UNIT:

TOPICS	RESOURCES
F. Cotton flower parts . Stigma . Style . Anther . Ovule . Petal . Sepal . Bract . Ovary wall . Staminal column G. Flower classifications . Complete . Incomplete . Perfect . Imperfect . Monoecious . Dioecious	

UNIT: Basic Principles of Plant Science

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
H. Describe in writing and/or by diagram the pollination and fertilization process.	H. ....
I. State at least two advantages of the vegetative reproduction of some plants.	I. ....
J. List the two vegetative methods of reproducing plants from below ground parts.	J. Observe demonstrations of and/or reproduce a sample plant or plants vegetatively.
K. List four vegetative means of reproducing plants from above ground parts.	K. Observe a demonstration of and/or reproduce a plant vegetatively using below ground parts, e.g., roots, corms, tubers, etc.
L. List the two major means of improving plants.	L. Observe a demonstration of and/or reproduce specimen plants by above ground parts, e.g., leaves, cutting, buds, etc.

UNIT: Basic Principles of Plant Science

SUB-UNIT:

TOPICS	RESOURCES
H. Pollination	
I. Vegetative reproduction vs reproduction by seed	. Mississippi State University. A Reference Unit on Basic Principles of Plant Science. pp. 21-29. . VEMC. Plant Science Transparencies . ....
J. Methods of underground vegetative reproduction . Roots . Tubers . Stolons . Rhizones . Tillers . Bulbs . Myceliums . Corms	
K. Methods of above ground vegetative reproduction . Layering . Cuttings . Budding . Grafting	
L. Methods of plant improvement . Selection . Controlled breeding	

UNIT: Basic Principles of Plant Science
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
M. List and describe in writing or by diagram the three major steps in producing hybrid seed corn.	M. ....
N. When given a description of each of the five recognized classes of certified seed in South Carolina, correctly label each as either Breeder Seed, Foundation Seed, Registered Seed, Certified Seed (Blue Tag) or Certified Seed (Green Tag).	N. Practice diagramming the three major steps in the hybridization process.
O.	O. Obtain and file sample seed certification tags of the six major types.

UNIT: Basic Principles of Plant Science
SUB-UNIT:

TOPICS	RESOURCES
M. Steps in hybridization . Inbreeding . Cross breeding . Double crossing	
N. Classes of certified seed . Breeder seed (white tag) . Foundation seed (white tag) . Registered seed (purple tag) . Certified seed (blue tag) . Certified seed (green tag)	. Mississippi State University. A Reference Unit on Basic Principles of Plant Science. pp. 31-33. . VEMC. Plant Science Transparencies . ....
O.	

UNIT: Basic Principles of Plant Science
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
IV. Explain in writing and/or by diagram the basic processes of plant growth.	IV. Observe demonstrations of and/or conduct demonstrations of the major plant processes.
A. Explain in writing and/or by diagrams the major contents of a plant cell.	A. Draw and label and/or label prepared drawings of a typical plant cell.
B. Explain in writing and/or by diagram the process of absorption.	B. Observe a demonstration of and/or conduct a demonstration of the process of absorption using a container of water, a semi-permeable membrane and colored salts.
C. Explain in writing, by formula, or by diagram the processes of photosynthesis.	C. Observe plant experiments which show the effects of photosynthesis.
D. Explain in writing and/or by diagram the process of digestion.	D. ....
E. Explain in writing and/or by drawing the process of assimilation.	E. Observe demonstrations of the effect or lack of effect of sunlight on assimilation.
F. Explain in writing and/or by drawing the process of respiration.	F. Observe demonstrations of the effect or lack of effect of sunlight on respiration.
G.	G. ....
V. State the major function and/or effect of the elements essential for plant growth.	V. ....
A. List the essential elements.	A. ....

UNIT: Basic Principles of Plant Science
SUB-UNIT:

TOPICS	RESOURCES
IV. Plant growth processes A. Cell characteristics . Contents . Protoplasm . Protoplasts . .... . Cell differentiation . Leaf . Wood . Storage . Conductive tissue	IV. Mississippi State University. *A Reference Unit on Basic Principles of Plant Science*. pp. 35-39. . VEMC. Plant Science Transparencies . ....
B. Absorption C. Photosynthesis D. Digestion E. Assimilation	. Mississippi State University. *A Reference Unit on Basic Principles of Plant Science*. pp. 35-39. . VEMC. Plant Science Transparencies . ....
V. Plant nutrition A. Essential elements . Carbon . Hydrogen . Oxygen . Phosphorus . Potash . Nitrogen . Sulfur . Calcium . Iron . Magnesium	V. Mississippi State University. *A Reference Unit on Basic Principles of Plant Science*. pp. 39-44. . VEMC. Plant Science Transparencies . ....

UNIT: Basic Principles of Plant Science
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
B. List the functions of the major nutrients.	B. ....
C. List the trace elements essential for plant growth.	C. ....
D. When given color pictures showing the major element deficiency symptoms of corn, identify and label.	D. Practice identifying element deficiency symtoms on some of the more typical farm crops. A class contest might be useful for this purpose.
E. State at least six factors considered in determining fertilizer needs. 1. List at least three major sources of nitrogen, e.g., nitrogen fixing bacteria, organic matter, fertilizer. 2. Compare and contrast the availability of N, P, and K in the soil. 3.	E. ....
F. Compare and contrast broadcast, band and bottom placement of fertilizer.	F. Illustrate fertilizer burn by placing fertilizer on or very near a growing plant. . ....
G. When given the analysis of a fertilizer, e.g., 6-16-16, state the number of pounds of nitrogen, phosphorus and potassium contained in a 200 lb. bag.	G. Practice interpreting fertilizer labels.
H.	H. ....
VI.	VI. ....

UNIT: Basic Principles of Plant Science
SUB-UNIT:

TOPICS	RESOURCES
B. Functions of major nutrients	
C. Trace elements	
D. Deficiency symptoms	
E. Determination of fertilization needs	. Mississippi State University. *A Reference Unit of Plant Science*. pp. 44-52.
. Plant removal	. VEMC. Plant Science Transparencies
. Soil factors . Chemical condition . Organic matter content . Physical condition . Degree of alkalinity or acidity	
F. Broadcast vs band application	
G. Interpreting the fertilizer bag label	
H.	. ....
VI.	VI. ....

RESOURCES

UNIT: Basic Principles of Plant Science

SUB-UNIT:

BOOKS	FILMS AND FILM STRIPS
Mississippi State University. A Reference Unit on Basic Principles of Plant Science. Jackson, Mississippi: Mississippi State Board of Vocational Education, 1964.	
BULLETINS	**TRANSPARENCIES**
	Vocational Education Media Center, Clemson University, Clemson, South Carolina. Plant Science Transparencies.

UNIT: Soils

SUB–UNIT:

OBJECTIVE(S): The student will be able to:

I. List the major steps in the evolution of a typical soil from rock.

II. List the major components of a typical soil.

III. When given four soils (representative of each of the four land classes) correctly label each.

IV. When given the land capability class of a given soil site and the major limiting conditions, select (from a list of recommended land treatments) those recommended for a given soil site.

V. Gather a soil sample using recommended procedure.

VI. Complete a typical soil sample information form.

VII. Interpret a soil sample report form.

VIII. ....

UNIT: Soils
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. List the major steps in the evolution of a typical soil from rock.	I. Observe as many stages of soil formation as is feasible.
II. List the major components of a typical soil.	II. As a class project prepare a "pie chart" showing the components of a typical soil.
III. When given four soils (representative of each of the four land classes) correctly label each.	III. Participate in a land use classification contest.
A. When given four soil surface textures (coarse, light, medium, and fine) correctly identify and label each as coarse, light, medium, or fine.	A. Prepare a collection representative of the four types of soil textures.
B. When given four soil sites or profiles with four levels of permeability, correctly identify and label each as slow, moderate, rapid, or very rapid.	B. Observe and/or prepare soil profiles representative of the four levels of permeability.
C. When given four soil sites or profiles of varying surface soil and subsoil depths, correctly identify and label each as deep, moderately deep, shallow, or very shallow.	C. Practice judging surface and subsoil depths.
D. When given four soil sites or profiles representative of each of the four categories of drainage correctly identify and label each as poor, fair, good, or excessive.	D. Observe representative sites and/or prepare profiles representing each of the four levels of drainage.

UNIT: Soils

SUB-UNIT:

TOPICS	RESOURCES
I. Soil formation.	I. Welch and McCart. An Introduction to Soils in the Southeast. Chapter 1.
II. Soil components . Air . Water . Mineral matter . Organic matter	II. Welch and McCart. An Introduction to Soils in the Southeast. Chapter 1.
III. Land use classification A. Texture . Coarse . Light . Medium . Fine	III. Department of Agricultural Education. Soil Identification and Land Treatment for Students in Vocational Agriculture.
B. Subsoil permeability . Slow . Moderate . Rapid . Very rapid	
C. Depth of surface soil and subsoil . Deep . Moderately deep . Shallow . Very shallow	. Department of Agricultural Education. Soil Identification and Land Treatment for Students in Vocational Agriculture.
D. Drainage . Poor . Fair . Good . Excessive	. Department of Agricultural Education. Soil Identification and Land Treatment for Students in Vocational Agriculture.

UNIT: Soils
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
E. When given six sites representative of six levels of wind or water erosion, identify and label each.	E. Observe representative sites of each of the six types of wind or water erosion.
F. When given six soil sites representative of the six levels of slope, identify and label each.	F. Observe representative sites of each of the six levels of slope. . Observe demonstrations of and/or use a slope indicator . ....
G. When given the surface texture, subsoil permeability, subsoil and surface soil depth, drainage erosion, and slope of a given soil, identify and label it according to one of the eight land capability classes.	G. Observe demonstrations of and/or classify soils representative of the eight land capability classes.
H.	H. ....

UNIT: Soils
SUB-UNIT:

TOPICS	RESOURCES
E. Erosion . Allurial deposits . None to slight . Moderate . Severe . Very severe . Very severe gullied	E. Department of Agricultural Education. Soil Identification and Land Treatment for Students in Vocational Agriculture.
F. Slope . Nearly level . Gently sloping . Moderately sloping . Strongly sloping . Steep . Very steep	F. Department of Agricultural Education. Soil Identification and Land Treatment for Students in Vocational Agriculture.
G. Land use classes	G. Department of Agricultural Education. Soil Identification and Land Treatment for Students in Vocational Agriculture.
H.	H. ....

UNIT: Soils
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
IV. When given the land capability class of a given soil site and the major limiting conditions, select (from the list of land treatments) those recommended for a given soil site.	IV. Practice selecting recommended practices for a given land capability class. . Prepare a list of recommended practice by land capability class. . ....
V. Gather a soil sample using recommended procedures. A. List the number of sampling points needed to adequately sample a typical five acre field. B. State the depth to which a typical soil should be sampled for a typical crop site - pasture site.	V. Observe demonstrations of and/or collect soil samples.
VI. Complete a soil sample information form.	VI. Observe demonstrations of and/or complete a soil information form.
VII. Interpret a soil sample report form.	VII. Practice the interpretation of soil sample reports.
VIII.	VIII. ....

UNIT: Soils
SUB-UNIT:

TOPICS	RESOURCES
IV. Land treatment recommendations	IV. Department of Agricultural Education. Soil Identification and Land Treatment for Students in Vocational Agriculture.
V. Soil sampling	V. VPI. Soils - Testing Soil.
A. Sampling	
B. Depth of sampling	
C.	
VI. Completing soil sample information form	VI. VPI. Soils - Testing Soil.
VII. Interpreting the soil sample report	VII. VPI. Soils - Testing Soil.
VIII.	VIII. ....

RESOURCES

UNIT: Soils

SUB-UNIT:

BOOKS

Welch, Charles D. and Gerald D. McCart. *An Introduction to Soil Science in the Southeast*. Chapel Hill, NC: The University of North Carolina Press, 1967.

FILMS AND FILM STRIPS

BULLETINS

Department of Agricultural Education. Published by the South Carolina State Department of Education, Columbia, S.C.
Soil Identification and Land Treatment for Students in Vocational Agriculture, 1965.

Agricultural Education, College of Education, Virginia Polytechnic Institute and State University in cooperation with the Agricultural Education Service, State Department of Education, Blacksburg, Virginia.
Soils-Testing Soil, publication AP-8, 1972.

TRANSPARENCIES

UNIT: Basic Pest Control

SUB-UNIT:

OBJECTIVE(S): The student will be able to:

I. Identify a given agricultural pest.

II. Select a recommended pest control treatment, method or procedure for a given pest.

III. Apply a pest control in a manner recommended in industry.

IV. Identify the major safety hazards involved in the use of pest control chemicals.

V. ....

UNIT: Basic Pest Control
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Identify a given pest.	I. Obtain, use and file references which provide information helpful in identifying pests. . Participate in agricultural pest identification contests. . Obtain and prepare displays of the major agricultura pests. . ....
A. Identify a given insect pest or its symptoms.	A. Obtain, use and file references which provide information helpful in identifying insects.
1. Cite at least one reference which provides pictures, drawings or other demonstrations of the more common insects, pests and/or their symptoms.	. Participate in an insect pest identification contest.
2. Identify a given insect using a selected identification key.	. Obtain and practice using an insect identification key.
3.	. ....

UNIT: Basic Pest Control
SUB-UNIT:

TOPICS	RESOURCES
I. Pest identification	I. Clemson University Cooperative Extension Service. . Agricultural Chemical Handbook. . Insect and Disease Identification Sheets - CE Series 1-28. . Jaques. Picture Key Nature Series, "How to Know Insects." . Metcalf/Flint/Metcalf. Destructive and Useful Insects.
A. Insect pest identification	
1. Reference for identification	
2. Using an identification key	
3.	

UNIT: Basic Pest Control
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
B. Identify a given disease pest and/or its symptoms.	B. Obtain, use and file a reference helpful in the identification of plant diseases and/or their symptoms.
1. Cite at least one reference which provides pictures, drawings, or other illustrations helpful in identifying the pest.	. Observe demonstrations of and practice using an identification key to identify diseases.
2. Identify a disease pest using a selected identification key.	. Observe demonstrations of and practice using the microscope to observe plant disease organisms.
3. Set up and use a microscope to observe a selected disease organism not otherwise visible.	. ....
C. Identify a selected weed.	C. Obtain, use and file references helpful in identifying the more common weeds.
1. Cite at least one reference which provides pictures, drawings or other illustrations helpful in identifying the weed plant.	. Observe demonstrations of and practice using an identification key to identify a selected weed.
2. Identify a given weed pest using a selected identification key.	. ....
3.	
D.	D. ....

UNIT: Basic Pest Control
SUB-UNIT:

TOPICS	RESOURCES
B. Disease identification or disease symptoms identification	B. Clemson University Cooperative Extension Service. . Agricultural Chemicals Handbook. . Insect and Disease Identification Sheets - CE Series 1-28. . ....
1. Reference for disease identification	
2. Using an identification key	
3. Setting up and using a microscope for disease identification	
4.	
C. Weed identification	C. Klingman. Weed Control - As A Science.
1. Reference for weed identification	. Clemson University Cooperative Extension Service. . Weeds of the Southern United States. . Agricultural Chemicals Handbook. . ....
2. Identification using a key	
3.	
D.	

UNIT: Basic Pest Control
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
II. Select a recommended pest control treatment, method, or procedure for a given pest.	II. Obtain, use and file references which provide recommended control methods for a given pest.
A. Cite at least one reference which lists recommended pest control treatments, methods, or procedures for a given pest.	. Observe demonstrations illustrating the use of various pest control methods or treatments.
B. List at least three types or methods of controlling pests.	. ....
C. List at least three types of chemicals used to control pests, e.g., solids, liquids, gases.	
D. List at least three basic forms of liquid chemicals commonly used for pest control, e.g., solutions, emulsions, wetable powders, etc.	
E. List at least three basic forms of solid chemicals commonly used for pest control, e.g., dusts, granular, etc.	
F.	

UNIT: Basic Pest Control
SUB-UNIT:

TOPICS	RESOURCES
II. Pest control treatments, methods or procedures	II. Clemson University Cooperative Extension Service.
A. Reference to control treatments, methods or procedures	. Agricultural Chemicals Handbook. . Annual Crop Production Circulars or Bulletins. . Annual Livestock Production Circulars or Bulletins. . Annual Entomology Circulars or Bulletins. . ....
B. Types of pest control . Chemical . Mechanical . Cultural	
C. Types of chemicals . Solids . Liquids . Gases	. Clemson University Cooperative Extension Service. . Agricultural Chemical Handbook.
D. Types of liquids . Emulsions . Solutions . Suspensions	. Clemson University Cooperative Extension Service. . Agricultural Chemical Handbook.
E. Types of solids . Dust . Granular	. Clemson University Cooperative Extension Service. . Agricultural Chemical Handbook.
F.	. .....

UNIT: Basic Pest Control
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
III. Apply a pest control in a manner recommended by the industry.	III. Observe demonstrations of and/or practice applying pest control treatments or methods.
A. Select recommended equipment or machinery.	A. Obtain, use and file a reference which provides machinery and equipment recommendations.
1. List various types of dusters, sprayers or mowing machines.	. ....
2. Compare and contrast the effectiveness of dusting vs spraying for the application of a given pest control chemical under given conditions.	
3. Cite at least one reference which gives machinery or equipment recommendations.	
4.	
B. Adjust and/or calibrate and operate a selected piece of application equipment.	B. Observe demonstrations of and practice adjusting, calibrating and operating a typical piece(s) of equipment used to apply chemicals.
1. Calibrate a selected sprayer.	. Observe a demonstration of and practice adjusting and safely operating a typical mower/mowers.
2. Calibrate a selected duster.	
3. Adjust a selected mower.	
4.	. ....
IV. Identify the major safety hazards involved in the use of pest control chemicals.	IV. Observe demonstrations illustrating the safe use and storage of pest control chemicals.
V.	V. ....

UNIT: Basic Pest Control
SUB-UNIT:

TOPICS	RESOURCES
III. Pest control application	III. Clemson University Cooperative Extension Service.
A. Selecting equipment	. Agricultural Chemicals Handbook.
1. Types of equipment . Dusters . Mowers . Sprayers	
2. Comparing dust vs spray application	
3. Reference for equipment selection	
4.	
B. Adjusting, calibrating and operating application equipment.	
1. Sprayer calibration	
2. Duster application	
3. Mower adjustment	
4.	
IV. Safety hazards	IV. Clemson University Cooperative Extension Service.
	. Pesticide Safety . PYH-L Leaflets 1-12
V.	V. ....

RESOURCES

UNIT: Basic Pest Control
SUB-UNIT:

BOOKS

Jaques, H.P. How to Know Insects - Picture Key Nature Series. DuDuque IA: William C. Brown Company, latest edition.

Klingman, Glenn. Weed Control - As A Science. NY: John Wiley and Sons, Inc., latest edition.

Metcalf/Flint/Metcalf. Destructive and Useful Insects. NY: McGraw-Hill Publishing Co., latest edition.

FILMS AND FILMSTRIPS

BULLETINS

Clemson University Cooperative Extension Service. Clemson University, Clemson, S.C. 29631.

- Agricultural Chemical Handbook.
- Insect and Disease Identification Sheets.
  CE Sheets 1-28.
- PHY-L Leaflets 1-12.

TRANSPARENCIES

UNIT: Identifying Ornamental Plants

SUB-UNIT:

OBJECTIVE(S): The student will be able to:

I. Identify selected ornamental plants without the use of a key.

II. Using a simplified key, identify selected ornamental plants.

III. ....

UNIT: Identifying Ornamental Plants
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Identify selected ornamental plants.	I. Participate in chapter or state ornamental plant identification contests.
A. Identify selected ornamental plants commonly used for landscaping homes, institutions or industrial plants without the aid of an identification key.	A. Participate in chapter identification contests.
1. Using pictures and/or actual trees, identify in writing at least ten selected trees commonly used for landscaping.	. Observe ornamental plants while on field trips.
2. Using pictures and/or actual shrubs, identify at least ten selected deciduous shrubs and ten evergreen shrubs commonly used for landscaping.	. Practice identifying ornamental plants used in your neighborhood. . Use references which show pictures, preferably color pictures, of ornamental plants to aid in learning to identify.
3. Using pictures and/or actual plants identify at least ten ground cover plants.	. Take or make color slides of the more commonly used ornamental plants. . Visit local nurseries and flower shops and observe the ornamental plants sold. See how many such plants can be identified. . Use nursery or seed catalogs to identify shrubs or flowers. . ....
4. Using pictures and/or actual plants, identify at least ten bedding plants and ten bulb crops used for home landscaping.	

UNIT: Identifying Ornamental Plants
SUB-UNIT:

TOPICS	RESOURCES
I. Identifying ornamental plants	
A. Identifying selected ornamental plants without the aid of a key.	A. OSU. Trees for Landscaping.
1. Identifying trees . Deciduous . Tall . Medium . Small . Evergreen . Tall . Medium . Small	. Symonds. The Tree Identification Book. . PSU. "Commonly Used Trees, Shrubs, Ground Covers and Vines". (52 Color Slides) . S.C. State Forestry Commission. Familiar Trees in South Carolina. . ....
2. Identifying Shrubs . Deciduous . Large . Medium . Small . Evergreen . Large . Medium . Small	. OSU. Shrubs for Landscaping. . Symonds. The Shrub Identification Book. . VEMC. "Horticultural Plants of Importance to Landscape Plans." (125 Color Slides) . PSU. "Commonly Used Trees, Shrubs, Ground Covers and Vines". . ....
3. Ground cover plants . Grasses . Other	
4. Bedding Plants . Seed type . Bulb type	4. Commercial Seed Company Catalogs . George J. Ball. The Ball Red Book.

UNIT: Identifying Ornamental Plants
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
B. Identify selected indoor ornamental plants commonly used in homes or businesses.	B. Participate in chapter identification contest.
1. When shown pictures and/or actual plants, identify at least ten foliage pot plants commonly used as indoor ornamental plants.	. Visit local florist and observe the plants sold.
2. When shown pictures and/or specimen plants, identify at least ten flowering pot plants commonly used as indoor ornamental plants.	. Prepare pictures of the more commonly sold indoor plants.
	. ....
C. Identify selected grasses commonly used for home lawns or institutional grounds.	C. Participate in chapter turf grass identification contest.
	. Prepare mounts of the more common turfgrasses.
	. Visit local turfgrass areas.
	. Prepare pictures of the more common turfgrasses.
	. ....
D.	D. ....

UNIT: Identifying Ornamental Plants
SUB-UNIT:

TOPICS	RESOURCES
B. Identifying selected indoor ornamental plants	B. PSU. Retail Flower Shop Operation and Management.
1. Identifying indoor foliage plants	. ....
2. Identifying indoor flowering plants	
C. Identifying selected turfgrasses	C. PSU. Turf Maintenance and Establishment. . PSU. "Turf Grass Identification" (30 Color Slides) . Hanson/Juska. Turfgrass Science. . ....
D.	D. ....

UNIT: Identifying Ornamental Plants

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
II. Identify selected ornamental plants using an identification key.	II. Observe demonstrations of and practice using an identification key to identify trees and shrubs.
A. Identify selected trees and shrubs using an identification key.	A. Obtain or practice using an identification key for trees and shrubs.
1. Classify a tree or shrub by leaf arrangements, e.g., alternate, opposite, etc.	. Prepare drawings on specimen mounts of various leaf arrangements, compositions, leaf forms, tips, bases and margins.
2. Classify a tree or shrub by leaf compositions, e.g., simple, bi-pinnately compound, pinnately compound, etc.	. Participate in an identification contest in which identification keys are used.
3. Classify a tree or shrub by leaf form, e.g., acicular, linear, oblong, etc.	
4. Classify a tree or shrub by leaf tips, e.g., oblanceolate, obovate, etc.	
5. Classify a tree or shrub by leaf base, e.g., obtuse, acute, etc.	

UNIT: Identifying Ornamental Plants
SUB-UNIT:

TOPICS	RESOURCES
II. Identifying ornamental plants using an identification key	II.
A. Identifying trees and shrubs with an identification key	A. S.C. State Commission of Forestry. Familiar Trees in South Carolina
1. Classifying trees or shrubs by leaf arrangement . alternate . opposite . whorled	. VEMC. "Horticultural Plants of Importance to Landscape Plans." Color Slides (125)
2. Classifying trees or shrubs by leaf composition . simple . bi-pinnately compound . pinnately compound . palmately compound	. PSU. "Commonly Used Trees, Shrubs, Groundcovers and Vines" (52 Color Slides)
3. Classifying trees or shrubs by leaf form . acicular . linear . oblong . oval	. ....
4. Classifying trees or shrubs by leaf tip form . oblanceolate . obovate	
5. Classifying trees or shrubs by leaf base form . obtuse . acute	

UNIT: Identifying Ornamental Plants
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
6. Classify a tree or shrub by leaf margin, e.g., entire, lobed, serrate, dentate, etc.	
7. When shown a drawing of a typical leaf, label the major parts.	. Practice labeling or drawing and labeling the major parts of a leaf.
8. When shown a drawing of a typical twig, label the major parts.	. Practice labeling or drawing and labeling the major parts of a twig.
9.	. ...
B. Identify selected turfgrasses using an identification key.	B. Observe demonstrations of and practice using an identification key to determine the identity of turfgrasses.
1. When shown a drawing of a typical grass plant, label the major parts.	. Participate in a turfgrass identification contest in which an identification key is used.
2. Classify a selected turfgrass leaf by seedhead type, e.g., spike, panicle, etc.	. Prepare specimen mounts of types of seedheads, ligules, auricles, bud types and sod types.
3. Classify a selected turfgrass by ligule, e.g., membranous, hairy, etc.	. ....
4. Classify a selected turfgrass by auricle, e.g., claw-like, short-stubby, etc.	

UNIT: Identifying Ornamental Plants
SUB-UNIT:

TOPICS	RESOURCES
6. Classifying trees or shrubs by leaf margin. . entire . lobed . serrate . dentate	
7. Labeling leaf parts	
8. Labeling twig parts	
9.	
B. Identifying selected turfgrasses using an identification key.	B. Hanson/Juska. Turfgrass Science
1. Labeling major plant parts	
2. Classifying grasses by seed head types . spike . panicle	. PSU. Turfgrass Identification (30 Color Slides)
3. Classifying grasses by ligule . membranous . hairy	. Scott Seed Co. A Guide to the Identification of Grasses.
4. Classifying grasses by auricle type. . claw-like . short and stubby	. ....

UNIT: Identifying Ornamental Plants

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
5. Classify a selected turfgrass by bud type, e.g., rolled, folded, etc.	
6. Classify a selected turfgrass by sod form, e.g., stolon, rhizome, etc.	
7.	
III.	III. ....

UNIT: Identifying Ornamental Plants

SUB-UNIT:

TOPICS	RESOURCES
5. Classifying grasses by bud type. . Rolled . Folded	
6. Classifying grasses by sod form. . stolon . rhizome	
III.	III. ....

RESOURCES

UNIT: Identifying Ornamental Plants
SUB-UNIT:

BOOKS

Ball, George J. The Ball Red Book. West Chicago, Ill: The George J. Ball Co., Current Edition.

Department of Agricultural Education. Retail Flower Shop Operation and Management. University Park, Pa.: The Department of Agricultural Education, The Pennsylvania State University. 1970.

Department of Agricultural Education. Turf Maintenance and Establishment. University Park, Pa.: The Department of Agricultural Education, The Pennsylvania State University, 1970.

Halfacre, R. G. Carolina Landscape Plants. Raleigh, N. C.: Sparks Press, 1971.

Hanson, A. A. and F. V. Turfgrass Science. Madison, Wisconsin: The American Society of Agronomy, Inc., 1969.

Ohio Agricultural Education Curriculum Materials Service. Shrubs for Landscaping. Columbus, Ohio: The Ohio State University, 1972.

Ohio Agricultural Education Materials Service. Trees for Landscaping. Columbus, Ohio: The Ohio State University, 1972.

Scott Seed Company. A Guide to the Identification of Grasses. Marysville, Ohio, The Scott Seed Company.

Symonds, George W. The Shrub Identification Book. New York: M. Barrows And Company, 1958.

Symonds, George W., The Tree Identification Book, New York: M. Barrows and Company, 1958.

FILMS AND FILMSTRIPS

The Pennsylvania State University
Department of Agricultural Education
University Park, Pennsylvania 16802

"Commonly Used Trees, Shrubs, Ground Covers and Vines" (52 Color Slides)

"Turfgrass Identification" (30 Color Slides)

The Vocational Education Media Center
109 Freeman Hall, Clemson University,
Clemson, S. C. 29631

"Horticultural Plants of Importance to Landscape Plans" (125 Color Slides)

TRANSPARENCIES

UNIT: Nursery Production

OBJECTIVE(S): The student will be able to:

I. Plan the propagation phase of a selected nursery production program.

II. Plan the "growing out" of a typical nursery crop in containers.

III. Perform selected grafts.

IV. Field plant and grow a typical nursery crop.

V. ....

UNIT: Nursery Production
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Plan the propagation phase of a selected nursery production program.	I. As a class or small group project, plan the propagation operations of a typical plant nursery.
A. Select the varieties to be propagated.	A. While visiting local nurseries observe the major crop produced. . Prepare a list of nursery crops and varieties of such crops grown in the local area. . ....
B. Compare and contrast the two major methods of rooting cuttings.	B. Ask a local nurseryman to compare rooting systems. . ....
C. Select the quantity of plants to be propagated.	C. While visiting local nurseries, determine the means used to establish the quantity of each of the major crops produced. . ....
D. Prepare a schedule for propagating the plant from time of cutting to field placement.	D. While visiting a local nursery, determine the yearly propagation schedule used. . As a class project, prepare a hypothetical production schedule for a typical nursery crop. . ....
E. Select a recommended method of propagating a selected horticultural plant. 1. Cite at least one source of information which gives recommended methods of propagating a selected plant.	E. Obtain and use a reference which lists recommended propagation methods for selected horticultural plants. . Prepare a list of propagation methods. . ....

UNIT: Nursery Production

SUB-UNIT:

TOPICS	RESOURCES
I. Planning the propagation phase	I. Local nurserymen
A. Selecting the varieties to be propagated	
B. Selecting a rooting system for cuttings	
C. Determining the quantity to be propagated	
D. Preparing the propagation schedule	. PSU. Nursery Production and Landscape Maintenance.
E. Selecting the method	. PSU. Nursery Production and Landscape Maintenance.
1. References	. Hartman/Kester. Plant Propagation - Principles and Practices.

UNIT: Nursery Production
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
2. List at least four recommended methods of propagating a selected plant.	
3.	
F. Select a recommended propagation and propagation system for a chosen plant.	F. Obtain and use a reference which lists recommended media for propagating selected horticultural plants.
1. List at least three commonly used ingredients.	
2. Cite at least one reference which provides recommended media mixtures for a selected crop.	
G. Prepare a recommended media for propagating a selected plant.	G. Observe demonstrations of and/or prepare media for propagating selected horticultural crops.
1. List at least five criteria for evaluating a propagation media.	. While visiting local nurseries, observe the media mixtures used.
2. Select, adjust and operate tools or equipment commonly used to mix media ingredients.	. Observe a demonstration of and/or practice using the equipment commonly used to mix soil ingredients.
3.	. ....
H. Select a recommended means and method of sterilizing a propagation media.	H. Obtain and file a reference which lists recommended methods, procedures, and/or chemicals for sterilizing media.
1. List at least three methods of sterilizing media.	. ....

UNIT: Nursery Production
SUB-UNIT:

TOPICS	RESOURCES
2. Methods . Stem cuttings . Leaf cuttings	. Welch. *Mist Propagation and Automatic Watering*.
F. Selecting a recommended media 1. Media ingredients . Sand . Peat . Verniculite . .... 2. References	. PSU. *Nursery Production and Landscape Maintenance*. . Hartman/Kester. *Plant Propagation Principles and Practices*. . ....
G. Preparing media . Criteria for evaluating media . Using soil mixing equipment	. PSU. *Nursery Production and Landscape Maintenance*. . Hartman/Kester. *Plant Propagation Principles and Practices*. . ....
H. Selecting a soil sterilization method 1. Methods . Steam . Chemical	. PSU. *Nursery Production and Landscape Maintenance*. . Hartman/Kester. *Plant Propagation Principles and Practices*. . ....

UNIT: Nursery Production
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
2. Cite at least one reference which lists recommended methods of sterilizing media.	
3.	
I. Sterilize a typical propagation media using a recommended method and procedure.	I. Observe demonstrations of and/or sterilize a typical media using the more commonly used procedures.
	. ....
J. Select a recommended season and/or time for taking cuttings of a chosen plant.	J. Obtain and use a reference which provides a recommended time for taking cuttings of a selected plant.
1. Cite at least one source of such information	. ....
2.	
K. When given a variety of cuttings of varying hardness and stages of growth, identify those recommended for cutting material.	K. Observe demonstrations of cuttings of varying stages of growth to determine those which are appropriate for rooting material.
	. ....
L. Prepare a selected cutting for propagation.	L. Observe demonstrations of and/or prepare cuttings for rooting.
1. List the recommended percent of leaf area to be retained.	. ....
2. List at least one recommended rooting harmone.	
3. List at least five factors to consider in keeping cuttings disease free.	
4.	

UNIT: Nursery Production
SUB-UNIT:

TOPICS	RESOURCES
I. Sterilizing soil mixtures	. PSU. Nursery Production and Landscape Maintenance. . Hartman/Kester. Plant Propagation Principles and Practices.
J. Selecting a recommended time for taking cuttings	. PSU. Nursery Production and Landscape Maintenance. . Hartman/Kester. Plant Propagation Principles and Practices.
K. Selecting material for making cuttings	. PSU. Nursery Production and Landscape Maintenance. . Hartman/Kester. Plant Propagation Principles and Practices.
L. Preparing a cutting for propagation	. ....

UNIT: Nursery Production
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
M. Place cuttings using recommended procedures.	M. Observe demonstrations of the placement of cuttings in the rooting medium.
1. List at least three criteria for evaluating cutting placement.	. ....
2. List at least three factors which affect cutting placement.	
3.	
N. Plan the environment for rooting a selected or typical bed of stem cuttings.	N. As a class project, prepare a light, temperature and water schedule for a hypothetical or actual bed of cuttings.
1. Prepare a relative humidity schedule for a typical bed of cuttings.	. .....
2. Prepare a light intensity schedule for a typical bed of cuttings.	
3. Prepare a temperature schedule for a typical bed of cuttings.	
4.	
O. Propagate a selected nursery plant(s) by seeds.	O. As a class, small group or individual project, propagate plants by seeding.
1. Select and prepare a recommended soil mixture.	1. Observe demonstrations of and/or prepare a typical soil mixture for seeding.

UNIT: Nursery Production
SUB-UNIT:

TOPICS	RESOURCES
M. Placing cuttings	. PSU. Nursery Production and Landscape Maintenance.
1. Criteria for evaluating placement	. Hartman/Kester. Plant Propagation Principles and Practices.
2. Factors which affect placement	. ....
3.	
N. Planning the environment of the cutting	. PSU. Nursery Production and Landscape Maintenance.
1. Humidity	. Hartman/Kester. Plant Propagation Principles and Practices.
2. Light	. ....
3. Temperature	
4.	
O. Propagating nursery plants by seeds	. PSU. Nursery Production and Landscape Maintenance.
1. Selecting and preparing the soil mixture	. Hartman/Kester. Plant Propagation Principles and Practices.
	. ....

UNIT: Nursery Production
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
2. Determine whether or not the seed need to be stratified or scarified to improve germination. Cite at least one reference which lists seeds which should be scarified or stratified for best germination.	2. Obtain and use a reference which lists seeds which should be stratified or scarified for best germination. . ....
3. Stratify or scarify a selected batch of seeds.	3. Observe demonstrations of and/or scarify a selected batch of seeds. . ....
4. Sow a flat(s) or otherwise plant selected seeds as recommended by the industry.	4. Observe demonstrations of and/or sow or otherwise place seeds in media for germination.
5. Select and maintain a recommended germination and maintenance environment for the seeds during and after germination. a. Select a recommended temperature schedule. b. Select a recommended relative humidity schedule. c. Select a recommended light schedule. d.	5. Prepare a recommended temperature, relative humidity and light control schedule for germinating and growing a selected batch of seeds. . ....

UNIT: Nursery Production
SUB-UNIT:

TOPICS	RESOURCES
2. Determining whether or not stratification or scarification is needed	. PSU. Nursery Production and Landscape Maintenance. . Hartman/Kester. Plant Propagation Principles and Practices. . ....
3. Stratifying or scarifying seeds	
4. Sowing or planting seeds	
5. Selecting and maintaining germination and maintenance environment a. Selecting a temperature schedule b. Selecting a relative humidity schedule c. Selecting a lighting schedule d.	. PSU. Nursery Production and Landscape Maintenance. . Hartman/Kester. Plant Propagation Principles and Practices. . ....

UNIT: Nursery Production
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
P. When given an appropriate reference, identify the symptoms of the more common propagation diseases, e.g., dampening-off and implement appropriate control measures.	P. Observe publications, films, other media which depict the more common rooting bed diseases or their symptoms.
1. Cite at least one reference which describes and/or depicts these disease conditions and recommends control measures.	. If possible, observe actual cases of "dampening-off" related diseases.
2. List the symptoms of the two most common diseases of the propagation bed.	. Obtain and use a reference on propagation bed diseases.
3.	. ....
Q. When given a variety of rooted cuttings, some ready for transplanting, others not, select and label those which are ready for transplanting.	Q. Observe demonstrations of selecting rooted cuttings ready for transplanting.
	. ....
R.	R. ....

UNIT: Nursery Production
SUB-UNIT:

TOPICS	RESOURCES
P. Identifying rooting bed diseases or symptoms of such diseases	. PSU. Nursery Production and Landscape Maintenance. . Hartman/Kester. Plant Propagation Principles and Practices.
1. References	. ....
2. Symptoms of diseases	
3.	
Q. Determining when rooted cuttings are ready for transplanting	. PSU. Nursery Production and Landscape Maintenance. . Hartman/Kester. Plant Propagation Principles and Practices.
	. ....
R.	

UNIT: Nursery Production
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
II. Plan the "growing out" of a typical nursery crop in containers.	II. As a class, small group or individual project, pot or can a typical batch of cuttings.
A. Select a recommended container, type and size. 1. List at least three criteria for selecting pots or cans. 2. List at least two types of pots or cans. 3. Cite at least one reference which gives recommended container types and sizes for a selected crop. 4.	A. While visiting local nurseries, observe the types of containers used for growing rooted cuttings. . Obtain and use a reference which lists recommended types and sizes of containers for various crops. . ....
B. Prepare a recommended container mixture. 1. Select a container mixture for a selected crop of rooted cuttings. a. List at least three criteria for selecting a potting mixture. b. Cite at least one source of potting mixture recommendations. 2. Select, adjust and safely operate equipment used to prepare potting mixtures. 3.	B. Obtain and file a reference which provides recommended mixtures for growing rooted shrubs in containers. . Observe a demonstration of and/or prepare a typical potting mixture. . ....

UNIT: Nursery Production
SUB-UNIT:

TOPICS	RESOURCES
II. Planning a container growing program	. PSU. Nursery Production and Landscape Maintenance.
A. Selecting container types	. Hartman/Kester. Plant Propagation Principles and Practices.
1. Criteria for selection	. Patterson. Container Growing.
2. Types . Cans . Pots	
3. References	
4.	
B. Preparing container mixtures	. PSU. Nursery Production and Landscape Maintenance.
1. Selecting the soil mixture	. Hartman/Kester. Plant Propagation Principles and Practices.
a. Criteria for selection	. ....
b. References	
2. Operating soil mixing equipment	
3.	

UNIT: Nursery Production
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
C. Pot a selected crop of rooted cuttings.	C. Observe demonstrations of and/or pot a batch of rooted cuttings.
1. List at least three criteria for evaluating the potting procedure.	. ....
2. List at least three factors to consider in potting rooted cuttings.	
3.	
D. Plan a recommended environmental control program for the potted cuttings.	D. As a class, small group, or individual project, prepare a light, temperature and water schedule for a typical crop of potted cuttings.
1. Select a recommended light condition.	. ....
2. Select recommended watering schedule.	
3. Select a recommended temperature schedule.	
4.	
E.	E. ....

UNIT: Nursery Production
SUB-UNIT:

TOPICS	RESOURCES
C. Potting the selected crop	. PSU. Nursery Production and Landscape Maintenance.
1. Criteria for evaluation	. Hartman/Kester. Plant Propagation Principles and Practices.
2. Factors to consider	. ....
3.	
D. Planning environmental control	. PSU. Nursery Production and Landscape Maintenance.
1. Selecting lighting conditions	. Hartman/Kester. Plant Propagation Principles and Practices.
2. Selecting watering schedule	. ....
3. Selecting temperature schedule	
4.	
E.	. ....

UNIT: Nursery Production
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
III. Perform selected grafts. A. Select a recommended grafting method for a given plant. B. List at least three possible reasons for grafting. C. Select appropriate growth stage or time for grafting. D. Select appropriate binding material if required. E.	III. As a class project, graft and grow a number of nursery plants using various procedures. . Observe demonstrations of and/or graft plants using a variety of commonly used methods. . Obtain and file a reference which provides recommended grafting procedures for a selected plant. . Observe demonstrations designed to illustrate the proper stages of growth and season for grafting. . ....

UNIT: Nursery Production
SUB-UNIT:

TOPICS	RESOURCES
III. Performing grafts	. Hartman/Kester. *Plant Propagation Principles and Practices*.
A. Methods . Scion . Bud . Whip	. PSU. *Nursery Production and Landscape Maintenance*.
B. Reasons for grafting	. VEMC. *Landscaping Home and School Grounds*.
C. Growth stage and time selection	. ....
D. Selecting binding materials	
E.	

UNIT: Nursery Production
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
IV. Field-plant and grow a selected nursery crop, e.g., trees, shrubs, bedding plants, etc.	IV. As a class, small group or individual project, field plant some or all of a selected nursery crop.
A. Select a recommended soil site for growing nursery stock. 1. List at least six criteria for selecting a soil site. 2. Classify a given soil as to class. 3.	A. Observe demonstrations designed to illustrate suitable and unsuitable soils for nursery crops. . Prepare a soil profile of an appropriate soil for nursery crops. . ....
B. Prepare a selected soil site for planting a chosen nursery crop. 1. Determine the fertility and pH level of the site. 2. Cite at least one reference which gives recommended fertility requirements for a selected nursery crop. 3.	B. Observe a demonstration of and/or prepare a soil site for field planting of rooted cuttings.
C. Fertilize a selected field. 1. Select a recommended method of fertilizing, e.g., row or broadcast. 2. Select, adjust, calibrate and operate selected application equipment. 3.	C. Obtain and use a reference which provides a recommended fertilizer for a selected crop. . Observe demonstrations of and/or operate selected application equipment. . ....

UNIT: Nursery Production
SUB-UNIT:

TOPICS	RESOURCES
IV. Field planting and growing rooted cuttings or container stock A. Site selection 1. Criteria for selection	. PSU. Nursery Production and Landscape Maintenance. . Hartman/Kester. Plant Propagation Principles and Practices. . Wyman. Trees for American Gardens.
2. Classifying soils 3.	. ....
B. Site preparation 1. Determining fertilizer needs 2. References	. PSU. Nursery Production and Landscape Maintenance. . Hartman/Kester. Plant Propagation Principles and Practices. . South Carolina State Commission of Forestry. Familiar Trees in South Carolina.
3.	. ....
C. Applying fertilizer 1. Selecting method 2. Using application equipment 3.	. PSU. Nursery Production and Landscape Maintenance. . Hartman/Kester. Plant Propagation Principles and Practices.

UNIT: Nursery Production
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
D. Transplant a selected nursery crop from the bed and/or container to a field. 1. List at least three factors to consider in transplanting. 2. Diagram and/or otherwise describe the position of the transplanted plant. 3.	D. Observe demonstrations of and/or transplant a selected crop or portion of a crop from the container to the field.
E. Plan a cultivation schedule and cultivate a selected field planting. 1. List the major weeds and/or grasses which attack the crop. 2. Prepare a mechanical and/or chemical control schedule. 3. Select, adjust, calibrate, and safely operate a typical cultivator or chemical weed sprayer. 4. Cite at least one publication which gives recommended chemicals for weed control. 5.	E. As a class, small group or individual project, plan a real or hypothetical cultivation program for a selected nursery crop. . Obtain and file a reference which provides a recommended chemical weed control schedule. . Observe demonstrations of and/or practice calibrating and operating sprayer equipment. . Observe demonstrations of and/or practice adjusting and operating cultivating equipment. . ....

UNIT: Nursery Production
SUB-UNIT:

TOPICS	RESOURCES
D. Transplanting	. PSU. *Nursery Production and Landscape Maintenance.*
1. Factors to consider . Depth . Soil compaction	. Hartman/Kester. *Plant Propagation Principles and Practices.* . ....
2. Placement of the plant	
3.	
E. Planning the cultivation program	. PSU. *Nursery Production and Landscape Maintenance.*
1. Weeds or grasses	. Hartman/Kester. *Plant Propagation Principles and Practices.*
2. Control schedule . Mechanical . Chemical	. ....
3. Equipment . Selection . Adjustment . Calibration . Operation	
4. References	
5.	

UNIT: Nursery Production
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
F. Plan an insect and disease control program for a selected nursery crop. 1. List the major insects and diseases which attack the selected nursery crop. 2. Prepare and/or cite a reference which gives an insect and disease control schedule for a selected crop. 3. Select, adjust, calibrate and safely operate a typical sprayer used for spraying horticultural crops. 4.	F. Obtain and use a reference which provides a recommended insect and disease control program for a selected nursery crop. . Observe demonstrations of and/or practice using spray equipment commonly used for spraying horticultural crops. . Prepare a bulletin board display of the more common insects and diseases (or their symptoms) which affect selected nursery crops. . ....
G. Set up and operate a typical irrigation system for a selected nursery crop.	G. Observe demonstrations of and/or set up a typica irrigation system for a selected nursery crop. . ....
H. Ball and burlap a selected nursery plant(s). 1. Diagram or otherwise describe the recommende procedure. 2. Select, adjust and safely operate digging equipment. 3.	H. Observe demonstrations of and/or ball and burlap selected nursery plants. . Observe demonstrations of and/or practice operating mechanical diggers. . ....
I.	
V.	V. ....

UNIT: Nursery Production
SUB-UNIT:

TOPICS	RESOURCES
F. Planning the insect and disease control program 1. Major insects and diseases 2. Control schedules 3. Equipment . Selection . Operation . Adjustment . .... . Calibration 4.	. PSU. Landscape Maintenance and Establishment. . Hartman/Kester. Plant Propagation Principles and Practices. . ....
G. Setting up and operating field irrigation equipment	. PSU. Nursery Production and Landscape Maintenance. . Hartman/Kester. Plant Propagation Principles and Practices. . ....
H. Balling and burlaping nursery plants 1. Steps in the procedure 2. Equipment . Selection . Operation . Adjustment . .... 3. .... I.	. PSU. Nursery Production and Landscape Maintenance. . Hartman/Kester. Plant Propagation Principles and Practices. . ....
V.	V. ....

RESOURCES

UNIT: Nursery Production
SUB-UNIT:

BOOKS

Hartman, H.T. and Kester, D.E. Plant Propagation Principles and Practices. Englewood Cliffs, NJ: Prentice Hall, 1959.

Patterson, James M. Container Growing. Washington, D. C.: American Association of Nurserymen, Inc.

Vocational Education Media Center. Landscaping Home and School Grounds. Clemson, SC: The Center in cooperation with the State Department of Education.

Welch, H. J. Mist Propagation and Automatic Watering. Washington, DC: American Association of Nurserymen, Inc.

FILMS AND FILMSTRIPS

STUDENT HANDBOOKS AND TEACHER GUIDES

The Pennsylvania State University, Department of Agricultural Education, University Park, Penn. 16802.

Nursery Production and Landscape Maintenance - A Student Handbook

Nursery Production and Landscape Maintenance - A Teacher's Guide

Landscape Maintenance and Establishment - A Student Handbook

Landscape Maintenance and Establishment - A Teacher's Guide

TRANSPARENCIES

UNIT: Nursery Production
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Compare and contrast the career opportunities related to nursery production. A. List the major career opportunities related to the maintenance or improvement of nursery production. B. Classify the career opportunities as to occupational levels, i.e., professional, technical, etc C. List the major competencies required for at least one career related to each of the major occupational areas. D. List the major activities performed by a person employed in at least one occupation associated with each of the major occupational areas. E. List the educational requirements of at least one job in each of the major occupational areas. F.	I. Interview people employed in careers related to nursery production. . Prepare an in-depth report on at least two occupations in nursery production which are of special interest. . Perform and/or observe some of the more typical tasks encountered by people employed in the jobs which are of greatest interest to you. . Arrange to spend an afternoon or full day with a person holding a job of your choice in nursery production. . Seek occupational work experience in the occupation of your choice. . If the occupation of your choice requires further schooling, investigate, with the help of your guidance counselor or teacher, the school's availability. . As a class project, play "What's My Line" using occupations in this area for "the mystery guest."

UNIT: Nursery Production

SUB-UNIT: Exploring Career Opportunities

OBJECTIVE(S). The student will be able to:

I. Compare and contrast the career opportunities related to nursery production.

II. List some of the ways in which a career in this area complements or fails to complement life goals.

III. ....

UNIT: Nursery Production
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
I. Career opportunities in or related to nursery production A. Careers . Nursery Owner . Nursery Manager . Nursery Worker . .... B. Occupational classification . Professional . Technical . Entry level . .... C. Competencies needed D. Training needed E.	I. Local people employed in nursery production. . Hoover. Handbook of Agricultural Occupations, pp. 263-283. . PSU. Nursery Production - A Student Handbook. . California Polytechnic State University. Careers in Ornamental Horticulture. . Holt/Evans/Mackin. Career Education. . Pinney. Beginning in the Nursery Business.

UNIT: Nursery Production
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
II. List some of the ways in which a chosen career in this area complements or fails to complement life goals.	II. Participate in a class debate of life goals.
A. List the ways in which a chosen career benefits society.	. Prepare a short paper concerning the ways in which a chosen career complements or fails to complement life goals.
B. List the ways in which a chosen career might benefit the student.	. As a class project, prepare a hypothetical radio program. Each student would select and bring from home a record of his choice. He would then prepare a brief "commercial" on the job of his choice. Then, he would act as a disc jockey as he played a record and gave his job brief as the "commercial."
C.	. ....
III.	III. ....

UNIT: Nursery Production
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
II. Career benefits	II. Hoover. *Handbook of Agricultural Occupations*, Chapters I, II, III and VIII.
A. Benefits to society	. VEMC. *The World of Work - Teacher's Guide*, Activity 9.
	. Pinney. *Your Future in the Nursery Business*.
B. Benefits to the individual	
C.	
III.	III. ....

RESOURCES

UNIT: Nursery Production
SUB-UNIT: Exploring Career Opportunities

BOOKS

Hoover, Norman K. Handbook of Agricultural Occupations. Danville, ILL: The Interstate Printers and Publishers, Inc., 2nd edition, 1969.

Holt, *et al*. Career Education, What it is and How to do It. Salt Lake City, Utah: Olympus Publishing Co.

Pinney, John J. Beginning in the Nursery Business, Chicago, ILL: American Nurserymen Association.

FILMS AND FILMSTRIPS

California Polytechnic State University
San Luis Obispo, California 93401
Careers in Ornamental Horticulture. Filmstrip.

TEACHER GUIDES

Vocational Education Media Center, 109 Freeman Hall, Clemson University, Clemson, S.C. 29631.

The World of Work - Teacher's Guide

TRANSPARENCIES

Vocational Education Media Center, 109 Freeman Hall, Clemson University, Clemson, S.C. 29631

The World of Work - Transparencies

UNIT: Greenhouse Crop Production

SUB-UNIT: Growing a Typical Fall Sequence Greenhouse Crop

OBJECTIVE(S): The student will be able to:

I. Plan and grow a typical crop of flowering pot plants propagated from cuttings and grown during the fall greenhouse crop sequence.

II. ....

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Plan and grow a typical crop of flowering pot plants propagated from cuttings and grown during the fall greenhouse sequence.	I. As a class, small group or individual project, plan and grow a typical crop of flowering pot plants propagated from cuttings and grown during the fall greenhouse sequence.
A. When given a variety of flowering pot plants, identify those more profitably grown in the local area.	A. Interview or visit local greenhouse growers to determine the major fall crops grown and the relative profitability of each.
1. List at least five flowering pot plants marketed by greenhouse growers in the local area.	. Do an elementary survey (perhaps by phone) to determine the relative and total demand for flowering pot plants in the local area.
2. List at least five factors to consider in selecting a flowering pot crop for production.	. ....
3.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

TOPICS	RESOURCES
I. Growing a fall crop of flowering pot plants from cuttings	I. Ball. *The Ball Red Book*. . Nelson. *Flower and Plant Production*. . PSU. *Greenhouse Crop Production - A Student Handbook*. . ....
A. Selecting the crop and variety	A. Ball. *The Ball Red Book*. . Nelson. *Flower Plant Production*. . PSU. *Greenhouse Production* - *A Student Handbook*.
1. Flowering pot plants . Chrysanthemums . Poinsettias	
2. Factors to consider in the selection . Greenhouse sequence . Profitability . Demand	
3.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
B. Propagate a typical flowering pot plant, e.g., chrysanthemums or poinsettias from cuttings in a manner approved by the industry.	B. Observe demonstrations of and/or practice selecting and taking cuttings of a selected flowering pot plant for propagation.
1. When given a variety of media, select those recommended for propagation.	. Observe demonstrations and/or practice selecting and preparing a rooting media.
2. When given a variety of cuttings, select those recommended for propagation.	. Observe demonstrations and practice placing cuttings in the rooting media.
3. When given a variety of temperature, relative humidity and light readings, select those readings recommended for a selected stage of propagation.	. Prepare a temperature and relative humidity schedule for a selected crop.
4. Place a cutting as recommended by the industry.	. ....
5.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

TOPICS	RESOURCES
B. Propagating a typical flowering pot plant	B. Ball. The Ball Red Book. . Nelson. Flower and Plant Production.
1. Selecting the media	. PSU. Greenhouse Crop Production - A Student Handbook.
2. Selecting cuttings	. PSU. Using the High School Greenhouse. . ....
3. Controlling the greenhouse environment	
4. Placing the cuttings	
5.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
C. Select and prepare a recommended potting mixture for a typical or given flowering pot plant.	C.
1. Cite at least one reference which lists recommended potting mixtures for a selected flowering pot plant.	1. Obtain, use and file a reference which provides recommended potting mixtures for selected flowering pot crops.
2. Prepare a typical potting mixture according to industry standards. a. Select, adjust and operate a typical soil mixer. b. Sterilize or treat a soil according to industry standards. 1. Cite at least one reference which lists recommended chemical sterilants. 2. List the procedures to be used and safety precautions to be observed. 3. .... c.	2. Observe demonstrations of and prepare a recommended potting mixture for a selected crop. . Observe demonstrations of and/or sterilize or otherwise treat a typical batch of soil or soil and pots. . ....
3. Diagram or otherwise describe the ideal arrangement of potting mixture and other material in a typical pot. a. List at least three criteria for evaluating the arrangement of potting mixture and other materials in a typical container. b. List at least two reasons for arranging the potting mixture with coarse materials at the bottom and finer materials at the top. c.	3. Observe demonstrations illustrating the ideal arrangement of soil in a pot, i.e., coarse material at the bottom and finer material at the top, etc. . ....
4.	4. ....

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

TOPICS	RESOURCES
C. Selecting and preparing the potting mixture	C. Ball. *The Ball Red Book*.
	. Nelson. *Flower and Plant Production*.
1. References to recommended potting mixtures	. PSU. *Greenhouse Crop Production - A Student Handbook*.
2. Preparing the mixture	. PSU. *Using the High School Greenhouse*.
a. Operating a soil mixer	. ....
b. Sterilizing or treating the soil	
1. References	
2. Steps involved	
3.	
c.	
3. Preparing a typical container of potting mixture	
a. Criteria for arranging the potting mixture	
b. Rationale for placing coarser materials at the bottom	
c.	
4.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
D. When given a variety of containers (sizes and types), identify those types and sizes recommended for use in growing a selected flowering pot crop.	D. Observe demonstrations which show the advantages and disadvantages of various container sizes and types for a selected crop.
1. Cite at least one reference which lists recommended containers, types and sizes for selected crops.	. While visiting local greenhouses, observe the sizes and types of containers used for flowering pot plants.
2. List at least two advantages and two disadvantages of a selected type of container.	. Conduct a demonstration using various sizes and types of containers for growing a selected crop.
3. List at least three types of containers.	. ....
4.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

TOPICS	RESOURCES
D. Selecting containers	D. Ball. *The Ball Red Book*. . Nelson. *Flower and Plant Production*.
1. References	. PSU. *Greenhouse Crop Production - A Student Handbook*. . PSU. *Using the High School Greenhouse*.
2. Advantages and disadvantages of selected types and sizes of containers	. ....
3. Types of containers	
a. Metal cans	
b. Clay pots	
c. Plastic pots	
d.	
4.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
E. Transplant or repot a rooted flowering pot plant to a larger container in a manner comensurate with industry standards.	E. Observe demonstrations of and transplant or repot a selected flowering pot crop.
a. List at least five factors to consider in transplanting or repotting.	. If feasible, visit a local greenhouse operation and observe the transplanting procedures used.
b. When given a variety of rooted cuttings, identify those ready for transplanting.	. Observe demonstrations designed to compare plants ready for transplanting and those not ready for transplanting.
c.	. ....

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

TOPICS	RESOURCES
E. Transplanting or repotting the rooted cuttings	E. Ball. The Ball Red Book.
	. Nelson. Flower and Plant Production.
a. Factors to consider on transplanting or repotting	. PSU. Greenhouse Crop Production - A Student Handbook.
b. Determining when rooted cuttings are ready to transplant	. PSU. Using the High School Greenhouse.
c.	. ....

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
F. Plan and conduct a recommended watering program or schedule for a selected or typical flowering pot plant.	F. As a class or small group project, plan and conduct a watering program or schedule for a selected flowering pot plant.
1. Estimate the moisture content of a pot of soil by "feel" or determine the moisture content by instrument.	1. Observe demonstrations illustrating methods of determining soil moisture content by "feel" or by instrument.
2. Compare and contrast the major systems of watering pot plants.	2. While visiting local greenhouse operations, observe the system used to water pot plants
3. Set up a typical watering system (individual pot type or mist system) in accordance with industry standards.	3. Observe demonstrations of setting up the watering system.
4.	4. ....

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

TOPICS	RESOURCES
F. Watering 1. Estimating the need for watering 2. Comparing watering systems for pot plants . Overhead sprinkler . Individual pot waterers . .... 3. Setting up the watering system 4.	F. Ball. The Ball Red Book. . Nelson. Flower and Plant Production. . PSU. Greenhouse Crop Production - A Student Handbook. . PSU. Using the High School Greenhouse. . ....

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
G. Prepare and conduct a plan for controlling the vegetative growth and/or flowering time of a selected crop through the manipulation of environmental variables (e.g. light, temperature, relative humidity), chemical means (fertilization, growth inhibitors, etc.) or mechanical (pruning, disbudding, pinching, etc.).	G. As a class or small group project. prepare and implement a plan for controlling the vegetative growth and flowering of a selected crop.
1. Plan a recommended light schedule for a selected flowering pot plant.	1. As a class or small group project, plan a lighting schedule for a selected crop.
a. Cite at least one reference which provides a light schedule for a selected crop. b. List at least two means of controlling light. c. Define in writing the term photoperiodism. d.	. Obtain, use and file a reference which provides a lighting schedule for a selected crop. . Observe demonstrations of various methods of controlling light, e.g., greenhouse covers, lime mixtures sprayed on glass, black cloth for covering poinsettias, artificial lights, etc. . While visiting local greenhouses, note means used for controlling the lighting of flowering pot plants. . ....

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing A Fall Sequence Greenhouse Crop

TOPICS	RESOURCES
G. Controlling growth and flowering time	G. Ball. The Ball Red Book. . Nelson. Flower and Plant Production. . PSU. Greenhouse Crop Production - A Student Handbook. . PSU. Using the High School Greenhouse. . ....
1. Planning the lighting program	
a. References	
b. Means of controlling light	
c. Photoperiodism	
d.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
2. Plan and conduct a recommended fertilization program or schedule for a selected flowering pot crop.	2. As a class or small group project, prepare a fertilization program or schedule for a selected flowering pot crop.
a. Identify plants which need fertilization.	. Observe demonstrations of plants which exhibit fertilizer deficiencies.
b. When given appropriate references, select a recommended grade and amount of fertilizer.	. Obtain, use and file references which list recommended fertilizers for a selected crop.
c. Compare and contrast the major means of fertilizing flowering pot plants.	. Observe demonstrations of and practice fertilizing a selected crop using the more commonly recommended methods, e.g., dry application, application of a premixed solution to each plant through the watering system, etc.
d.	. ....

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

TOPICS	RESOURCES
2. Planning the fertilization program	2. Ball. The Ball Red Book.
	. Nelson. Flower and Plant Production.
a. Determining the need for fertilization	. PSU. Greenhouse Crop Production.
	. PSU. Using the High School Greenhouse.
b. References	. ....
c. Comparing methods of application	
d.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
3. If applicable to the selected crop, determine the need for and pinch, prune, disbud a chosen crop. a. Cite at least one reference which lists recommended schedules for disbudding or pinching. b. Pinch, prune or disbud a selected plant at a time and in a manner recommended by the industry. c.	3. Observe demonstrations illustrating the need for vegetative growth or flower growth control. . Obtain, use and file a reference which provides a recommended schedule for disbudding or pinching. . List at least five means of vegetative or flower growth control. . Observe demonstrations of the disbudding, pinching or pruning for growth control.
4. If applicable to the selected crop, determine the need for, select and use a growth regulation in a manner acceptable to the industry. . Cite at least one reference which lists recommended growth regulators for a selected crop, their application rate and methods. . Select, adjust, calibrate and use spray equipment to apply a growth regulator.	4. Obtain, use and file a reference which provides information concerning recommended growth regulating chemicals, their application rate and methods. . Observe demonstrations of and/or practice adjusting, calibrating and operating spray equipment recommended for applying growth regulation. . ....

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

TOPICS	RESOURCES
3. Pinching, pruning or disbudding	3. Ball. The Ball Red Book.
	. Nelson. Flower and Plant Production.
a. References	. PSU. Greenhouse Crop Production - A Student Handbook.
b. Pinching, pruning or disbudding	. PSU. Using the High School Greenhouse.
	. ....
c.	
4. Using growth regulators	
a. References	
b. Selecting, adjusting, calibrating and operating equipment	
c.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
H. Plan and conduct a recommended pest control program for a selected greenhouse flowering pot plant crop.	H. As a class or small group project, plan and conduct a pest control program for a selected greenhouse pot plant crop.
1. List and with the aid of references, identify the three major insects or disease pests of a selected crop.	1. Obtain, use and file a reference which provides information helpful in identifying and controlling the major insect and disease pests of the selected crop.
2. Cite at least one reference which provides information helpful in identifying and controlling the major insect and disease pests.	2. Observe demonstrations of and practice adjusting, calibrating and safely operating equipment typically used in controlling insect and disease pests.
3. Select, adjust, calibrate and safely operate equipment typically used to control pests.	
4.	
I. When applicable to the crop, wrap a selected flowering pot plant for delivery to a retailer according to recommended industry practices.	I. Observe demonstrations of and practice wrapping potted plants for delivery.
J.	J. ....
II.	II. .....

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Fall Sequence Greenhouse Crop

TOPICS	RESOURCES
H. Controlling pests	H. Ball. *The Ball Red Book*.
	. Nelson. *Flower and Plant Production*.
1. Identifying the major pests	. PSU. *Greenhouse Crop Production*.
	. PSU. *Using the High School Greenhouse.*
	. ....
2. References on pest control	
3. Selecting, adjusting, calibrating and using pest control equipment	
4.	
I. Wrapping the crop for delivery	I. PSU. *Greenhouse Crop Production - A Student Handbook*.
	. ....
J.	J. ....
II.	II. ....

RESOURCES

UNIT: Greenhouse Crop Production

SUB-UNIT: Growing a Typical Fall Sequence Greenhouse Crop

BOOKS

George J. Ball Inc. Staff. The Ball Red Book. Chicago, ILL: George J. Ball, Inc. Current Edition.

Nelson, Kennard S. Flower and Plant Production in the Greenhouse. Danville, ILL: The Interstate Printers and Publishers, Inc., 1967.

FILMS AND FILMSTRIPS

STUDENT HANDBOOKS AND TEACHER GUIDES

The Pennsylvania State University Department of Agricultural Education. University Park, PA 16802.

- Greenhouse Crop Production - A Student Handbook
- Greenhouse Crop Production - A Teacher's Guide
- Using the High School Greenhouse

TRANSPARENCIES

UNIT: Greenhouse Crop Production

SUB-UNIT: Growing a Typical Winter Sequence Greenhouse Crop

OBJECTIVE(S): The student will be able to:

I. Plan and grow a typical crop of flowering pot plants propagated from bulbs and grown during the winter greenhouse sequence.

II. ...

UNIT: Greenhouse Crop Production

SUB-UNIT: Growing a Typical Winter Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Plan and grow a typical crop of flowering pot plants propagated from bulbs and grown during the winter greenhouse sequence.	I. As a class, small group or individual project, plan and grow a crop of flowering pot plants propagated from bulbs and grown during the winter greenhouse sequence.
A. When given a variety of winter sequence crops, identify those most profitably grown in the local area.	A. Interview or visit local greenhouse growers to determine the major winter crops grown and the relative profitability of each.
1. List at least two bulb crops grown during the winter greenhouse sequence in the local area.	. Do an elementary survey (perhaps by phone) to determine the relative and total demand for a winter crop of flowering pot plants such as daffodils or Easter lilies.
2. List at least five factors to consider in selecting a bulb crop for production.	. ...
3. ...	
B. Select and prepare a recommended potting mixture for a selected bulb crop.	B. Observe a demonstration of and/or prepare a potting mixture for a selected bulb crop.
1. Cite at least one reference which lists recommended potting mixtures for selected bulb crops.	. ...
2. Prepare a typical potting mixture according to industry standards.	
3. List at least two ingredients commonly recommended for use in potting soil mixtures.	
4. ...	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Winter Sequence Greenhouse Crop

TOPICS	RESOURCES
I. Growing a bulb crop during the winter greenhouse sequence A. Selecting the crop and variety 1. Winter grown bulb crops . Daffodils . Easter lilies 2. Factors to consider . Profitability . Local demand . Greenhouse sequence	I - A. Ball. The Ball Red Book. . Nelson. Flower and Plant Production. . P.S.U. Greenhouse Crop Production - A Student Handbook. . P.S.U. Using the High School Greenhouse.
B. Preparing the potting mixture 1. References which provide recommended mixtures 2. Preparing the mixture 3. Mixture ingredients . Topsoil . Sand . Peat . ... 4. ...	B. Ball. The Ball Red Book. . Nelson. Flower and Plant Production. . P.S.U. Greenhouse Crop Production - A Student Handbook. . P.S.U. Using the High School Greenhouse. . ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Winter Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
C. Diagram or otherwise describe the arrangement of soil in a typical container in which a bulb is to be placed.	C. Observe demonstrations illustrating the ideal arrangement of soil in a container in which a bulb is to be planted, i.e., coarser material at the bottom, finer material at the top, etc.
. ...	. ...
D. When given a variety of containers (types and sizes), identify those recommended for use in growing a selected bulb crop.	D. While visiting local growers, note the types and sizes of containers used. While interviewing local growers ask them to give reasons for using the types and sizes of containers used.
1. Cite at least one reference which lists the recommended container types and sizes for selected crops.	
2. List at least two advantages and disadvantages of a selected type of container.	. Observe demonstrations designed to show the advantages and disadvantages of various container sizes and types.
3. List at least three types and sizes of containers commonly used for growing bulb crops.	. Conduct a demonstration using various sizes and types of containers for growing a selected bulb crop.
4. ...	. ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Winter Sequence Greenhouse Crop

TOPICS	RESOURCES
C. Preparing the pot of soil	C. Ball. The Ball Red Book. . Nelson. Flower and Plant Production. . P.S.U. Greenhouse Crop Production - A Student Handbook. . P.S.U. Using the High School Greenhouse. . ...
D. Selecting a container type and size 1. References which give recommended container types and sizes 2. Comparing container types 3. Types and sizes of containers . Types . Sizes . Clay . 6" . Plastic . 8" . Cans . 10" . ... . 12" 4. ...	D. Ball. The Ball Red Book. . Nelson. Flower and Plant Production. . P.S.U. Greenhouse Crop Production - A Student Handbook. . P.S.U. Using the High School Greenhouse. . ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Winter Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
E. Pot (plant) a selected bulb crop in a manner comensurate with industry practices. 1. Cite at least one reference which gives recommended planting depths and dates. 2. List at least two factors to consider in potting bulbs. 3. ...	E. Observe demonstrations of and pot a quantity of bulbs. . ...
F. Plan and conduct a recommended watering program or schedule for a selected typical bulb crop. 1. Cite at least one reference which provides a recommended watering program for growing a selected bulb crop. 2. Compare and contrast hand vs. automatic watering by overhead sprinkler or individual pot waterers. 3. Determine the need for watering by "feel" or through the use of instruments. 4. With aid of references, prepare a watering and/or relative humidity schedule for the selected crop. 5. Read and interpret a hygrometer. 6. ...	F. Obtain and file a reference which provides a recommended water program or schedule for a selected crop. . While visiting local growers, observe the type of watering system used. . As a class or small group project, prepare a watering schedule. . Observe demonstrations of and practice determining the soil moisture level and relative humidity using a hygrometer. . ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Winter Sequence Greenhouse Crop

TOPICS	RESOURCES
E. Potting the bulb 1. References 2. Factors to consider . Depth of bulb . Soil compaction . ... 3. ...	E. Ball. The Ball Red Book. . Nelson. Flower and Plant Production. . P.S.U. Greenhouse and Crop Production - A Student Handbook. . P.S.U. Using the High School Greenhouse. . ...
F. Watering a bulb crop 1. References which give recommended watering schedules 2. Comparing watering methods . Hand watering . Overhead sprinkler . Individual pot waterers 3. Determining the need . By "feel" . By instruments 4. Preparing a watering schedule 5. Reading a hygrometer 6. ...	F. Ball. The Ball Red Book. . Nelson. Flower and Plant Production. . P.S.U. Greenhouse Crop Production - A Student Handbook. . P.S.U. Using the High School Greenhouse. . ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Winter Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
G. Regulate the flowering time of a selected bulb crop in accordance with industry standards. 1. List at least four recommended ways to regulate flowering time. 2. Identify the recommended flowering dates of the major bulb crops. 3. Determine the amount of precooling needed for forcing a selected bulb. 4. ...	G. Plan and conduct demonstrations illustrating the effect of precooling on forcing a selected bulb crop, e.g., daffodils, Easter lilies, etc. . Plan and conduct demonstrations illustrating the effect of temperature and/or light on forcing a selected bulb crop. . ...
H. Plan and conduct a recommended fertilization program. 1. Identify plants which need fertilization. 2. When given appropriate references, select a recommended grade and amount of fertilizer for a given bulb crop. 3. When given ratio of a solution of fertilizer and water to be used, prepare the mixture to the proportion specified. 4. ...	H. As a class, small group or individual project, plan and/or conduct a recommended fertilization program. . Observe demonstrations of and practice preparing fertilizer solutions to be applied through the water system or by hand waterers. . ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Winter Sequence Greenhouse Crop

TOPICS	RESOURCES
G. Regulating flowering time 1. Means of regulating flowering time . Precooling . Lighting . Fertilization . ... 2. Determining the desired flowering dates 3. Determining the amount of precooling needed for forcing 4. ...	G. Ball. *The Ball Red Book.* . Nelson. *Flower and Plant Production.* . P.S.U. *Greenhouse Crop Production - A Student Handbook*. . P.S.U. *Using the High School Greenhouse*.
H. Fertilizing the crop 1. Determining the need 2. Reference which gives recommended fertilizer schedules 3. Preparing a fertilizer solution 4. ...	H. Ball. *The Ball Red Book.* . Nelson. *Flower and Plant Production.* . P.S.U. *Greenhouse Crop Production - A Student Handbook*. . P.S.U. *Using the High School Greenhouse.* . ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Winter Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
I. Plan a recommended lighting schedule for a selected bulb crop which is comensurate with industry standards.	I. As a class or small group project, plan a recommended lighting schedule for a selected bulb crop.
1. Cite at least one reference which provides a recommended lighting schedule for a selected bulb crop.	. Obtain and file a reference which provides a recommended lighting schedule.
2. Compare and contrast natural lighting, incandescent or flourescent lights.	
3. ...	. ...
J. Plan and conduct a pest control program for a selected bulb crop which is comensurate with industry approved practices.	J. As a class or small group project, plan a pest control program for a selected bulb crop.
1. List, and with the aid of references, identify the three major insects or disease pests of a typical bulb crop.	. Obtain and file a reference which gives illustrations or pictures helpful in identifying the major insects and diseases or symptoms of such pests.
2. Cite at least one reference which provides information helpful in identifying and controlling the major insect and disease pests of bulb crops.	. Observe demonstrations of and/or adjust, calibrate and operate equipment commonly used for pest control.
3. Select, adjust, calibrate and safely operate equipment commonly used for pest control.	. ...
4. ...	
K. ...	K. ...
II. ...	II. ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Winter Sequence Greenhouse Crop

TOPICS	RESOURCES
I. Planning a lighting schedule or program 1. References which provide recommended light schedules 2. Comparing types of lighting . Natural . Incandescent . Flourescent . ... 3. ...	I. Ball. The Ball Red Book. . Nelson. Flower and Plant Production. . P.S.U. Greenhouse Crop Production - A Student Handbook. . P.S.U. Using the High School Greenhouse. . ...
J. Controlling pests 1. Identifying the major pests . Insects . Diseases 2. References which provide identification aids and control methods 3. Selecting, adjusting, calibrating and operating equipment 4. ...	J. Ball. The Ball Red Book. . Nelson. Flower and Plant Production. . P.S.U. Greenhouse Crop Production - A Student Handbook. . P.S.U. Using the High School Greenhouse. . ...
K. ...	K. ...
II. ...	II. ...

RESOURCES

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Winter Sequence Greenhouse Crop

BOOKS

Ball, George J. Inc. Staff. The Ball Red Book. Chicago, Ill.: George J. Ball, Inc., Current Edition.

Nelson, Kennard S. Flower and Plant Production in the Greenhouse. Danville, Ill.: The Interstate Printers and Publishers, Inc., 1967.

FILMS AND FILMSTRIPS

STUDENT HANDBOOKS AND TEACHER GUIDES

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- Using the High School Greenhouse.

TRANSPARENCIES

UNIT: Greenhouse Crop Production

SUB-UNIT: Growing a Typical Spring Sequence Greenhouse Crop

OBJECTIVE(S): The student will be able to:

I. Plan and grow a typical crop of bedding plants propagated from seed and grown during the spring greenhouse sequence.

II. ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Spring Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Plan and grow a typical crop of bedding plants propagated from seed and grown during the spring greenhouse sequence.	I. As a class, small group or individual project, plan and grow a selected crop of bedding plants.
A. When given a selection of bedding plant crops and varieties, select those crops and varieties most profitably grown in the local area.	A. While visiting local greenhouse growers, determine the major bedding plants grown locally.
1. List at least five bedding plant crops grown in the local area. 2. List at least five factors to consider in selecting a profitable bedding plant crop. 3. Cite at least one reference which lists recommended varieties of bedding plants. 4. ...	. Obtain and file a reference which provides a listing of recommended varieties of bedding plants for commercial production. . ...
B. Select and prepare in accordance with industry standards a recommended media for a seed flat in which bedding plants are to be germinated.	B. Observe demonstrations of and prepare a media for germinating bedding plants.
1. Cite at least one reference which provides such recommendations. 2. Select, adjust and operate soil mixing equipment. 3. List at least two typical media ingredients used for seed germination. 4. Compare and contrast the major media, e.g., sand vs. vermiculite, etc. 5. ...	. Obtain and file a reference which provides recommended media for germinating bedding plants. . ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Spring Sequence Greenhouse Crop

TOPICS	RESOURCES
I. Growing bedding plants A. Selecting bedding plant crops and varieties of crops 1. Bedding plants . Petunias . Marigolds . Salvia . ... 2. Factors to consider in selection . Profitability . Time sequence with other crops . ... 3. Reference to recommended varieties 4. ...	I - A. P.S.U. Greenhouse Crop Production. . Nelson. Flower and Plant Production, pp. 229 - 237. . Ball. The Ball Red Book. . P.S.U. Using the High School Greenhouse. . ...
B. Preparing the germinating media 1. References 2. Soil mixing equipment . Selecting . Adjusting . Operating . ... 3. Media ingredients . Sand . Vermiculite . ... 4. Media comparison 5. ...	B. Nelson. Flower and Plant Production, pp. 229 - 237. . Ball. The Ball Red Book. . P.S.U. Using the High School Greenhouse. . ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Spring Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
C. Select a prepared mixture for a selected bedding plant crops.	C. While visiting local greenhouse growers as a class or as individuals, determine the soil mixture(s) used for bedding plant crops.
1. Compare and constrast prepared soil mixtures commonly used for bedding plants.	• Obtain use and file a reference which compares prepared mixture.
2. Cite at least one reference which compares and contrasts prepared soil mixtures.	• ....
3.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Spring Sequence Greenhouse Crop

TOPICS	RESOURCES
C. Selecting prepared mixtures	C. Ball Co. *The Ball Red Book*.
1. Comparing mixtures	. Local growers
2. Using references	. ....
3.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Spring Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
D. Sterilize or otherwise treat a batch of media and/or flat of media to be used for seed germination in accordance with industry standards.	D. Observe demonstrations of and practice treating soil using the recommended methods.
E. Seed a flat or individual container of bedding plants in a manner comensurate with industry standards. 1. List at least two methods of seeding flats or other types of containers. 2. Cite a rule-of-thumb for selecting a planting depth. 3. Cite at least one reference which provides recommended seeding dates, planting depths, and seeding quantities or spacings. 4. ...	E. Observe demonstrations of and seed a flat of bedding plants. . Obtain and file a reference which provides recommended planting dates, depth of planting and quantities per flat or spacings. . ...
F. Compare and contrast (where applicable) germinating and growing bedding plants in individual containers or clusters of containers vs. germinating seeds in flats and transplanting to individual containers after germination.	F. As a class project or experiment, germinate and grow a quantity of bedding plants in clusters of individual containers. Compare the results with the crop germinated in flats and transplanted later to individual containers.
. ...	. ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Spring Sequence Greenhouse Crop

TOPICS	RESOURCES
D. Sterilizing or treating media	D. Nelson. Flower and Plant Production, pp. 229 - 237. . Ball. The Ball Red Book. . P.S.U. Greenhouse Crop Production - A Student Handbook. . P.S.U. Using the High School Greenhouse. . ...

E. Seeding a flat or individual container
1. Method of germination and/or growing
  . Seed flat germination
  . Sectionalized containers
  . ...
2. Depth of planting
3. References
4. ...
	E. Nelson. Flower and Plant Production, pp. 229 - 237.
	. P.S.U. Greenhouse Crop Production - A Student Handbook.
	. Ball. The Ball Red Book.
	. P.S.U. Using the High School Greenhouse.
	. ...

F. Comparing methods of production . Seed flats . Sectionalized containers	F. Nelson. Flower and Plant Production, pp. 229 - 237. . P.S.U. Greenhouse Crop Production - A Student Handbook. . Ball. The Ball Red Book. . P.S.U. Using the High School Greenhouse. . ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Spring Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
G. Plan and maintain a recommended environmental schedule for a selected bedding plant crop from seeding to transplant stages.	G. As a class or small group project, plan and maintain an environmental control schedule for a selected bedding plant crop from the seeding to transplant stages.
1. Cite at least one reference which provides recommended temperature and/or relative humidity schedules for typical bedding plant crops.	. Obtain, use and file a reference which provides recommended temperature, humidity and light schedules.
2. Prepare a schedule of temperature and relative humidity levels generally recommended at this stage of development.	. Observe demonstrations of and practice watering a selected bedding plant crop.
3. Water a container of seeds in a manner recommended by the industry. a. Compare and contrast at least two means of watering germinating bedding plants. b. List at least three factors to consider in watering germinating bedding plants. c. ...	. Observe demonstrations of the major methods of providing bottom heat for propagating plants. . ...
4. Compare and contrast at least three means of providing heat to germinating bedding plants.	
5. ...	

TOPICS	RESOURCES
G. Controlling the environment from seeding to transplant	G. Ball. The Ball Red Book.
1. References which provide schedules	. Nelson. Flower and Plant Production, pp. 229 - 237.
2. Environmental schedules . Relative humidity . Temperature	. P.S.U. Greenhouse Crop Production - A Student Handbook. . P.S.U. Using the High School Greenhouse. . ...
3. Watering a flat a. Methods of watering . Overhead sprinkler . Sub-irrigation . ... b. Factors to consider . Method . Frequency	
4. Methods of providing heat for germination . Heating pads . Germination ovens	
5. ...	

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Spring Sequence Greenhouse Crop

OBJECTIVES	LEARNING ACTIVITIES
H. Transplant a selected bedding plant crop in a manner comensurate with industry standards.	H. Observe demonstrations of and transplant a selected bedding plant crop.
1. When given seedlings in various stages of development, select those ready for transplanting.	. Observe demonstrations which compare and contrast seedlings ready for transplanting and those not ready for transplanting.
2. List at least three characteristics which indicate a plant is ready for transplanting. 3. Diagram or otherwise overtly describe the handling of a plant during the transplanting process.	. Observe demonstrations illustrating the proper handling of a seedling during transplanting.
4. ...	. ...
I. Prepare and implement an environmental control schedule (heat, relative humidity and light), for the selected bedding plant crop from the transplant stage (or equivalent if germinated and grown in same container) to the ready-for-market stage.	I. As a class or small group project, prepare an environmental control schedule for a selected bedding plant crop from transplant to market stages.
1. Cite at least one reference which provides such a schedule.	. Obtain, use and file a reference which provides a recommended light, temperature and humidity schedule.
2. Compare and contrast the major watering systems typically used, e.g., hand watering with a hose and sprinkler, overhead sprinkler system, etc. 3. ...	. ...
J. ...	J. ...
II. ...	II. ...

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Spring Sequence Greenhouse Crop

TOPICS	RESOURCES
H. Transplanting 1. Determining readiness 2. Characteristics of a seedling ready for transplanting 3. Handling the plant during transplanting 4. ...	H. Nelson. Flower and Plant Production, pp. 229 - 237. . P.S.U. Greenhouse Crop Production - A Student Handbook. . Ball. The Ball Red Book. . P.S.U. Using the High School Greenhouse. . ...
I. Controlling the environment from transplant stage to market stage 1. References 2. Comparing watering systems used during the transplant to market stage 3. ...	I. Ball. The Ball Red Book. . Nelson. Flower and Plant Production, pp. 229 - 237. . P.S.U. Greenhouse Crop Production - A Student Handbook. . P.S.U. Using the High School Greenhouse. . ...
J. ...	J. ...
II. ...	II. ...

RESOURCES

UNIT: Greenhouse Crop Production
SUB-UNIT: Growing a Typical Spring Sequence Greenhouse Crop

BOOKS

Ball, George J., Inc. Staff. The Ball Red Book. Chicago, Ill.: George J. Ball, Inc., Current Edition.

Nelson, Kennard S. Flower and Plant Production. Danville, Ill.: The Interstate Printers and Publishers, Inc., 1967.

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TRANSPARENCIES

UNIT: Greenhouse Crop Production

SUB-UNIT: Exploring Career Opportunities

OBJECTIVE(S): The student will be able to:

I. Compare and contrast the career opportunities in greenhouse crop production.

II. List some of the ways in which a career in this area complements or fails to complement life goals.

III. ....

UNIT: Greenhouse Crop Production
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Compare and contrast the career opportunities in greenhouse crop production.	I. Interview people employed in careers related to greenhouse crop production.
A. List the major career opportunities in greenhouse crop production.	. Prepare an in-depth report on at least two occupations in greenhouse crop production which are of special interest.
B. Classify the career opportunities as to occupational levels, i.e., professional, technical, etc.	. Perform and/or observe some of the more typical tasks encountered by people employed in the jobs which are of greatest interest to you.
C. List the major competencies required for at least one career related to each of the major occupations.	. Arrange to spend an afternoon or full day with greenhouse producers.
D. List the major activities performed by a person employed in at least one occupation.	. Seek occupational work experience in greenhouse crop production.
E. List the educational requirements of at least one job.	. If the occupation of your choice requires further schooling, investigate, with the help of your guidance counselor or teacher, the availability of such a school.
F.	. ....

UNIT: Greenhouse Crop Production
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
I. Career opportunities in or related to greenhouse crop production A. Careers . Greenhouse Owner . Greenhouse Manager . Greenhouse Worker . .... B. Occupational classification . Owner . Manager . Worker . .... C. Competencies needed D. Training needed E.	I. Local people employed in greenhouse crop production. . Hoover. Handbook of Agricultural Occupations, Chapter XI. . ....

UNIT: Greenhouse Crop Production
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
II. List some of the ways in which a chosen career in this area complements or fails to complement life goals.	II. Participate in a class debate of life goals.
A. List the ways in which a chosen career benefits society.	. Prepare a short paper concerning the ways in which a chosen career complements or fails to complement life goals.
B. List the ways in which a chosen career might benefit the student.	. As a class, small group or individual project, prepare a want ad giving a job description for a selected position.
C.	
III.	

UNIT: Greenhouse Crop Production
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
II. Career benefits	II. Hoover. Handbook of Agricultural Occupations, Chapter XI. . VEMC. The World of Work, Activity 9.
A. Benefits to society	
B. Benefits to the individual	
C.	. ....
III.	III. ....

RESOURCES

UNIT: Greenhouse Crop Production
SUB-UNIT: Exploring Career Opportunities

BOOKS

Hoover, Norman K. Handbook of Agricultural Occupations. Danville, ILL: The Interstate Printers and Publishers, Inc., 2nd edition, 1969.

FILMS AND FILMSTRIPS

TEACHER GUIDES

Vocational Education Media Center, 109 Freeman Hall, Clemson University, Clemson, S.C. 29631.

The World of Work - A Teacher's Guide

TRANSPARENCIES

Vocational Education Media Center, 109 Freeman Hall, Clemson University, Clemson, S.C. 29631.

The World of Work - Transparencies

UNIT: Turfgrass Establishment and Maintenance

SUB-UNIT: Turfgrass Establishment

OBJECTIVE(S): The student will be able to:

I. Plan the establishment of a recommended turf on a selected site for a selected purpose.

- A. Select a recommended turfgrass variety for given use and climatic conditions.
- B. Prepare a soil for planting a selected turfgrass in a manner comensurate with industry standards.
- C. Seed, sod or sprig a selected turfgrass area in a manner comensurate with industry standards.
- D. Renovate a typical turfgrass area in which over 50% of the grass is of the desired variety. The renovation will be accomplished in a manner comensurate with industry standards.
- E. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Plan the establishment of a recommended turf on a selected site for a selected purpose.	I. As a class, small group or individual project, establish turfgrass small plots exemplary of the actual turfgrass areas.
A. Select a recommended turfgrass variety or variety mixture for a given use and climatic condition.	A. As a class, take a field trip to observe varieties of turfgrass used in home lawns, athletic fields, roadsides and golf courses in the local area.
1. Cite at least one reference which lists recommended turfgrass varieties for various uses and various climatic conditions. 2. List and identify at least one turfgrass variety or mixture of varieties recommended for each of the major uses and adopted to the local climate. 3. List the major uses of turfgrass. 4.	. Pictures or slides might be made for use with future classes. . Obtain, use and file a reference which provides recommended grasses for the local area. . ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

TOPICS	RESOURCES
I. Planning the establishment of a turfgrass area	I. PSU. Turfgrass Maintenance and Establishment - A Student Handbook.
	. Musser. Turf Management.
A. Selecting a variety	. ....
1. References on variety selection	
2. Identifying locally grown turfgrass	
3. Uses of turfgrass	
4.	

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

OBJECTIVES	LEARNING ACTIVITIES
B. Prepare a soil for planting a selected turfgrass in a manner comensurate with industry standards.	B. As a class, prepare a soil profile of an ideal soil for a selected turfgrass.
1. Classify and/or evaluate a given soil site.	. Practice classifying and evaluating various soils in the area - perhaps on the school grounds.
2. Recommend soil ingredients or amendments needed to make an acceptable soil profile. 3. Prepare a recommended soil profile.	. As a class or small group, prepare a batch of topsoil to be used for establishing the special turfgrass areas, e.g., athletic fields. Add the amendment needed, e.g., organic materials (rotted manure, well rotted sawdust, etc.); coarse sand, etc.
4. Take a soil sample and interpret soil test results.	. Observe demonstrations of and/or take soil samples and practice interpreting the test.
5. Select, adjust and operate the soil preparation and fertilization equipment typically used in preparing a soil for planting.	. As a class, prepare the soil for a home lawn, small athletic field to be established in the local community.
6. When given a variety of soil conditions to choose from, select that condition recommended as best for seeding, sodding, or sprigging.	. Observe demonstrations of the adjustment and operation of soil preparation equipment and practice the use of such equipment.
7.	. As a class, visit a site where a new athletic field, home lawn or golf course is being established and observe the procedures used.
	. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

TOPICS	RESOURCES
B. Preparing the soil for planting 1. Classifying or evaluating soils 2. Selecting amendments 3. Preparing an ideal soil profile 4. Taking a soil sample and interpreting the test results 5. Selecting, adjusting and operating soil preparation and fertilization equipment . Tilling equipment . Disk . Rotary hoe . Cultivator . Drag or smoothing harrow . Fertilizer application equipment . Hopper type . Cyclone type . .... . Finishing equipment . Handvaks . .... 6. Selecting the soil conditions needed . Organic . Manure . Sawdust . Peat . Inorganic . Sand . Clay . .... 7.	. PSU. Turfgrass Maintenance and Establishment - A Student Handbook. . Musser. Turf Management. . ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

OBJECTIVES	LEARNING ACTIVITIES
C. Seed, sod or sprig a selected turf area in a manner comensurate with industry standards.	C. As a class project, seed, sod or sprig a selected turf.
1. Select a recommended method of propagation.	1. While visiting sites where home lawns, athletic fields, golf courses and other turfgrass areas are being established, note the method (seeding, sodding or sprigging) being used. Also observe the process used to seed, sod or sprig.
a. Compare and contrast seeding, sprigging, plugging.	
b. Cite at least one reference which lists recommended methods of establishing a given turfgrass variety.	. Obtain, use and file a reference which provides recommended establishment methods for a selected variety of grass.
c.	. ....
2. Seed a selected area in a manner approved by the industry.	2. As a class project, seed a home lawn or other commonly seeded turfgrass area or a turf plot on the school ground.
a. Select, adjust, calibrate and operate seeding equipment typically used by the industry.	. Observe demonstrations of and practice adjusting, calibrating and using seeding equipment
b. Cite at least one reference which provides recommended seeding dates, qualities of seeds required per square foot, and depth of planting.	. Obtain, use and file a reference which provides recommended seeding dates, quantities of seed required, depth of planting, etc.
c.	. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

TOPICS	RESOURCES
C. Seeding, sodding or sprigging	. PSU. Turfgrass Maintenance and Establishment - A Student Handbook.
1. Selecting the method	. Musser. Turf Management.
a. Comparing the methods . Seeding . Sodding . Sprigging	. ....
b. Reference on selecting method	
c.	
2. Seeding	
a. Selecting, adjusting and calibrating equipment . Cyclone . Hopper	
b. References on seeding	
c.	

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

OBJECTIVES	LEARNING ACTIVITIES
3. Sod, sprig or stolonize a selected turfgrass area. a. Select, adjust and operate sodding, sprigging or plugging equipment or tools typically used by the industry. b. Cite at least one reference which gives recommended planting dates, spacings, and depth of planting. c.	3. As a class project, sod or sprig an actual turfgrass area in the local community (home lawn, athletic field or golf green) or sod or sprig a demonstration plot on the school grounds. . Observe demonstrations of and practice using sodding or sprigging machinery or tools. . Obtain, use and file a reference which provides recommended planting dates, spacings, and depth of planting for locally adopted turfgrass. . ....
4. Mulch a selected new planting in a manner recommended by the industry. a. List and identify at least four mulches recommended and used by the industry. b. List at least two means of anchoring mulches. c.	4. Observe demonstrations of and mulch a newly planted turfgrass. . ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

TOPICS	RESOURCES
3. Sodding and sprigging a. Selecting, adjusting and operating sodding, sprigging, or stolonizing equipment. b. Reference on planting . Dates . Spacing . Depth of planting c.	
4. Mulching a newly established turfgrass a. Mulching materials . Wheat straw . Hay . Pine straw . .... b. Methods of anchoring mulches . Wire . String . Petroleum products . .... c.	. PSU. Turfgrass Maintenance and Establishment - A Student Handbook. . Musser. Turf Management. . ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

OBJECTIVES	LEARNING ACTIVITIES
5. Plan a recommended watering program for a newly planted turfgrass. a. Estimate the moisture content of the soil by feel or by use of moisture measuring instruments. b. Identify wilting of the grass due to low relative humidity and/or winds. c. Compare and contrast the more commonly used methods of watering. 1. List at least five criteria for selecting watering equipment. 2. List at least three methods of watering a newly established turfgrass.	5. Observe demonstrations of and practice determining the moisture content of soil by measuring instruments or by feel. . Observe demonstrations of commonly used watering equipment - observe type of coverage, water particle, size, convenience, etc. . ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

TOPICS	RESOURCES
5. Planning a watering program for a newly established turfgrass	. PSU. Turfgrass Maintenance and Establishment - A Student Handbook.
a. Estimating moisture content of the soil	. Musser. Turf Management.
. Moisture measuring equipment	. ....
. Feeling	
. ....	
b. Identifying wilting due to low relative humidity and/or wind	
c. Comparing and contrasting methods of watering	
1. Criteria for selecting watering equipment	
2. Methods of watering	
. Underground . Above ground	
. Hard nozzles . Portable sprinklers	

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

OBJECTIVES	LEARNING ACTIVITIES
6. Plan a recommended pest control program for a newly planted turfgrass.	6. As a class project, plan a pest control program for a newly established turfgrass.
a. With the aid of appropriate references, identify the major turfgrass pests or symptoms of such pests.	. Obtain, use and file references which provide identification clues and recommended control procedures for the more common turfgrass pests.
b. With the aid of appropriate references, select recommended control measures.	. Observe demonstrations of and practice adjusting, calibrating and using equipment or tools commonly used for turfgrass pest control.
c. Select, adjust, calibrate and safely use pest control equipment.	. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

TOPICS	RESOURCES
6. Planning a recommended pest control program for a newly planted turfgrass a. Identifying pests or their symptoms . Insects . Nematodes . Chinch bugs . Grubs . Scales . Diseases . Dollar spot . Brown spot . Fairy ring . Pythium blight . Powdery mildew . .... . Weeds . Nutgrass . Crabgrass . Dandelion . Plantain . Clover . .... b. Reference for identification and control methods c. Selecting, adjusting and calibrating spraying or dusting equipment d.	. PSU. Turfgrass Maintenance and Establishment - A Student Handbook. . Musser. Turf Management. . ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

OBJECTIVES	LEARNING ACTIVITIES
D. Renovate a typical turfgrass area in which over 50% of the grass is of the desired variety. The renovation will be accomplished in a manner comensurate with industry standards.	D. As a class project, renovate an existing turf - perhaps a section of the school grounds.
1. List the steps typically recommended for renovating an existing turf.	. Observe demonstrations of and/or practice the use of all types of equipment used in the renovation process.
2. Select, adjust and safely operate soil aerators, vertical slicers or other equipment commonly used to prepare the turfgrass area for seeding.	. ....
3. Select, adjust, calibrate and operate seeding equipment.	
4. Select, adjust and operate seed covering and packing equipment.	
5.	
E.	E. ....
II.	II. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

TOPICS	RESOURCES
D. Renovating a typical turfgrass area	. PSU. Turfgrass Maintenance and Establishment - A Student Handbook. . Musser. Turf Management. . ....
1. Steps . Mowing . Removing clippings . Spraying pest control . Aerating . Vertical slicer to cut through thatch . Aerator . .... . Seeding . Covering seed . Packing seed	
2. Selecting, adjusting and operating the aerator and vertical slicer	
3. Selecting, adjusting, calibrating and operating seeding equipment	
4. Selecting, adjusting, and operating seed covering and packing equipment	
5.	
E.	E. ....
II.	II. ....

RESOURCES

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Establishment

BOOKS

Musser, H. Burton. Turf Management. NY: McGraw-Hill, 1962.

FILMS AND FILMSTRIPS

The Pennsylvania State University, Department of Agricultural Education, University Park, PA 16802.

Turfgrass Identification (30 color slides) $5.00 per set

Types of Turf (17 color slides) $3.00 per set

STUDENT HANDBOOKS AND TEACHER GUIDES

The Pennsylvania State University, Department of Agricultural Education, University Park, PA 16802.

Turfgrass Maintenance and Establishment - A Student Handbook

Turfgrass Maintenance and Establishment - A Teacher's Guide

TRANSPARENCIES

UNIT: Turf Establishment and Maintenance

SUB-UNIT: Turf Maintenance

OBJECTIVE(S): The student will be able to:

I. Plan and conduct a maintenance program for a selected turf in a manner comensurate with industry standards.

  A. Maintain a typical home lawn in a manner comensurate with industry standards.

  B. Maintain a typical athletic field turf in a manner comensurate with industry standards.

  C. Plan and/or conduct a maintenance program for a selected golf course green in a manner comensurate with industry standards.

II. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Plan and conduct a maintenance program for a selected turf.	I. As a class, small group or individual project, plan and perform the maintenance tasks required on typical turf areas in the local community.
A. Maintain a typical home lawn in a manner comensurate with industry standards.	A. As a class, small group or individual project, plan and perform the maintenance tasks required on a selected home lawn.
1. Plan and conduct a recommended fertilization program.	1. As a class, plan a fertilization program for a typical home lawn or lawns.
a. Take a soil sample and interpret test results.	. Observe demonstrations of and practice taking soil samples and interpreting the results.
b. Select, adjust, calibrate and operate fertilizer application equipment.	. Observe demonstrations of and practice adjusting, calibrating and using commonly used fertilizer application equipment.
c. Cite at least one reference which provides fertilization recommendations for a selected turfgrass.	. Obtain, use and file references which provide fertilization recommendations.
d. Compare and contrast various types of fertilizers.	. Observe demonstrations which show the difference in availability rate and other characteristics of fertilizers.
e. Identify and recommend methods of preventing fertilizer burn.	. Observe demonstrations designed to illustrate fertilizer burn and to show how to prevent such a burn.
f.	. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

TOPICS	RESOURCES
I. Maintaining turfgrass areas	I. Hanson/Juska. Turfgrass Science.
	. Musser. Turf Management.
A. Maintaining the home lawn	. PSU. Turf Maintenance and Establishment - A Student Handbook.
1. Planning a recommended fertilization program	. Sunset Staff. Lawns and Ground Covers.
	. ....
a. Taking soil samples	
b. Selecting, adjusting, calibrating and operating application equipment	
c. References of home lawn fertilization	
d. Comparing and contrasting fertilizers	
e. Identifying and preventing fertilizer burn	
f.	

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

OBJECTIVES	LEARNING ACTIVITIES
2. Plan and conduct a recommended mowing program for a selected home lawn.	2. As a class or individual project, plan a mowing program and mow a selected home lawn.
a. List at least five factors to consider for determining when to mow.	. Observe demonstrations (perhaps on school turfgrass plots) showing the effects of different mowing heights and frequencies on selected grasses commonly used for home lawns.
b. Cite at least one reference which provides recommended mowing heights for different turfgrasses.	. Obtain, use and file a reference which provides recommended mowing heights for grasses typically used for home lawns in the local community.
c. Select, adjust and operate mowers commonly used for mowing home lawns.	. Observe demonstrations of and practice adjusting and safely operating mowers typically used for mowing home lawns.
d.	. ....
3. Plan and conduct a recommended watering program or schedule for a typical home lawn.	3. As a class project, plan and conduct a watering program for a typical home lawn.
a. List at least five criteria for determining when to water.	. Observe demonstrations of the determination of soil moisture by feel or by the use of moisture testing equipment.
b. Compare and contrast commonly used watering equipment.	. Observe demonstrations of and practice using the more commonly used types of watering equipment used on home lawns.
c.	. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

TOPICS	RESOURCES
2. Planning and conducting a mowing program a. Factors to consider . Mowing height . Mowing frequency . .... b. References for recommended mowing by variety c. Selecting, adjusting and operating mowing equipment d. .... 3. Planning and conducting a watering program a. Criteria for determining when to water b. Comparing and contrasting watering equipment c.	. Hanson/Juska. Turfgrass Science. . Musser. Turf Management. . PSU. Turf Maintenance and Establishment - A Student Handbook. . Sunset Staff. Lawns and Ground Covers. . ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

OBJECTIVES	LEARNING ACTIVITIES
4. Plan and conduct a recommended pest control program for a selected home lawn.	4. As a class, small group or individual project, plan and conduct a pest control program for a typical or selected home lawn.
a. With the aid of appropriate references, identify the major pests which attack home lawns or symptoms of such pests.	. Obtain, use and file references which aid in the identification of the major pests or symptoms of such pests which attack home lawns.
b. With the aid of appropriate references, select recommended control measures.	. Obtain, use and file references which provide recommended control measures for the major pests which attack home lawns.
c. Select, adjust, calibrate and safely use pest control equipment.	. Observe demonstrations of and practice adjusting, calibrating and safely using pest control equipment.
d.	. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

TOPICS	RESOURCES
4. Planning and conducting a pest control program	. Couch. Diseases of Turfgrasses.
a. Identifying pests	
1. Insects . Chinch bugs . Scales . Grubs	
2. Diseases . Dollar spot . Fairy ring . Brown patch	
3. Weeds . Nutgrass . Wild onion . Crabgrass . Clovers . Dandelion . .... . Plantain	
4. Small animals . Moles . Rabbits	
5.	
b. Selecting pest control measures	
c. Selecting, adjusting, calibrating and operating pest control equipment	
d.	

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

OBJECTIVES	LEARNING ACTIVITIES
B. Maintain a typical athletic field turf in a manner comensurate with industry standards.	B. As a class or small group project, plan and conduct a maintenance program for a typical athletic field. . Interview the person responsible for the maintenance of athletic fields for the local high schools, college or university.
1. With the aid of an appropriate reference, identify the turfgrass varieties commonly used on athletic fields in the local area.	1. Obtain, use and file references helpful in identifying turfgrass varieties commonly used on athletic fields in the local area.
a. Cite at least one reference which provides aid in identifying turfgrasses commonly used on athletic fields.	. ....
b. List at least two turfgrass varieties commonly used on athletic fields in the area.	
c.	

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

TOPICS	RESOURCES
B. Maintaining athletic fields	. Hanson/Juska. Turfgrass Science. . Musser. Turf Management. . PSU. Turf Maintenance and Establishment - A Student Handbook.
1. Identifying turfgrass varieties	
a. Reference for identification	
b. Typical turfgrass varieties for athletic fields	
c.	

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

OBJECTIVES	LEARNING ACTIVITIES
2. Plan and/or conduct a recommended fertilization program for a typical athletic field.	2. As a class or small group project, plan a fertilization program for a typical athletic field (perhaps the school baseball or football field.)
a. Take a soil sample and interpret the test results. b. Select, adjust, calibrate and operate fertilizer application equipment. c. Prepare a fertilization calendar. d. Cite at least one reference which provides fertilizer recommendations for athletic fields. e.	. Interview the local school or county grounds superintendent (if one exists) to determine fertilization practices used on local athletic fields. . Observe demonstrations of and practice adjusting, calibrating and safely operating fertilizer application equipment typically used on athletic fields. . As a class project, prepare a typical fertilization calendar for a selected athletic field. . ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

TOPICS	RESOURCES
2. Planning and conducting a fertilization program for an athletic field a. Taking soil samples and interpreting test results b. Selecting, adjusting, calibrating and operating application equipment c. Preparing a fertilization calendar d. References e.	. Hanson/Juska. Turfgrass Science. . Musser. Turf Management. . PSU. Turf Maintenance and Establishment - A Student Handbook.

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

OBJECTIVES	LEARNING ACTIVITIES
3. Plan and conduct a recommended mowing program for a typical athletic field.	3. As a class or small group project, plan and conduct a mowing program for a typical or selected athletic field (perhaps the local school athletic field).
a. List at least five factors to consider in determining frequency, height or amount of cut.	. While interviewing the person responsible for maintaining the local athletic field, determine the mowing practices and schedule followed.
b. Select, adjust, and safely operate equipment commonly used for mowing athletic fields.	. Observe demonstrations of and practice adjusting and safely operating mowing equipment commonly used on athletic fields.
c. Cite at least one reference which provides recommended mowing heights for turfgrass commonly used on athletic fields.	. Obtain, use and file references which provide recommended mowing heights for turfgrasses commonly used on athletic fields.
d.	. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

TOPICS	RESOURCES
3. Planning and conducting a mowing program for athletic fields a. Factors to consider . Height . Frequency . Amount of cut . .... b. Selecting, adjusting and operating mowing equipment c. References d.	. Hanson/Juska. Turfgrass Science. . Musser. Turf Management. . PSU. Turf Maintenance and Establishment - A Student Handbook.

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

OBJECTIVES	LEARNING ACTIVITIES
4. Aerate a typical athletic field.	4. Observe samples of overly compacted and non-compacted turf.
a. When given samples of overly compacted and non-compacted soils, differentiate between the two and label each.	. Observe demonstrations of and practice adjusting and safely operating commonly used aeration equipment.
b. List at least three reasons for aerating a turfgrass soil.	. ....
c. Select, adjust and safely operate commonly used aeration equipment.	
d.	
5. Plan and conduct a watering program for a typical athletic field.	5. As a class, small group or individual project, plan a watering program for a typical athletic field.
a. State the usual rule-of-thumb concerning the depth of watering.	. Observe demonstrations and practice determining the moisture content of soils by feel.
b. Estimate within 1 day the length of time required for a selected athletic field to dry after a 6" watering.	. Observe demonstrations designed to show the water holding ability of selected soils.
c. Estimate the moisture content of soil by feel and come within 25% of that determined by instrument measurement.	. Observe demonstrations designed to determine the amount and distribution of water applied during a given watering.
d. Determine the amount of water applied in a given watering.	
e.	. ....
6.	6. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

TOPICS	RESOURCES
4. Aerating athletic fields	. Hanson/Juska. Turfgrass Science.
a. Identifying compacted soils	. Musser. Turf Management.
b. Reasons for aerating	. PSU. Turf Maintenance and Establishment - A Student Handbook.
c. Equipment . Selection . Operation . Adjustment	
d.	
5. Watering athletic fields	
a. Guidelines for watering	
b. Estimating drying time	
c. Estimating moisture content	
d. Determining the amount of water applied	
c.	

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

OBJECTIVES	LEARNING ACTIVITIES
C. Plan and/or conduct a maintenance program for a selected golf course green in a manner comensurate with industry standards.	C. As a class project, plan and/or conduct a maintenance program for a typical or selected golf green. . Interview a local golf course superintendent to determine the maintenance program used. . ....
1. With the aid of an appropriate reference, identify the turfgrass varieties commonly used on golf greens in the local area.	1. Obtain, use and file a reference helpful in identifying turfgrass typically used on golf greens in the local area. . Prepare a sample display on turfgrasses used on local greens. . ....
2. Plan and/or conduct a fertilization program for a typical golf course green.	2. Obtain, use and file a reference which gives recommended fertilization rates, types and practices.
a. Take a soil sample and interpret the test results.	. Observe demonstrations and practice taking soil samples and interpreting the test results.
b. Cite at least one reference which provides fertilizer recommendations for golf greens. c. Select, adjust, calibrate and use greens fertilization equipment.	. Observe demonstrations of and/or practice adjusting, calibrating and operating fertilizer application equipment commonly used on golf course greens.
d.	. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

TOPICS	RESOURCES
C. Maintaining golf course greens 1. Identifying turfgrasses used locally on greens 2. Fertilizing greens a. Taking soil samples and interpreting test results b. Reference on greens fertilization c. Selecting, adjusting and calibrating fertilization equipment d.	. Hanson/Juska. *Turfgrass Science.* . Musser. *Turf Management*. . PSU. *Turf Maintenance and Establishment - A Student Handbook*.

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

OBJECTIVES	LEARNING ACTIVITIES
3. Plan a mowing program for a typical golf course green. a. List a rule-of-thumb to use as a guide for mowing greens. b. List at least five factors to consider in determining the frequency, height or amount of cut to take. c. Select, adjust and safely operate equipment commonly used for mowing golf course greens. d.	3. As a class project, plan and/or conduct a mowing program for a selected golf course green. . While interviewing or visiting a local golf course superintendent, determine the mowing practices used. . Observe demonstrations of and practice adjusting and operating various types of mowing equipment commonly used for mowing golf course greens. . ....
4. Aerate a typical green in a manner comensurate with industry standards. a. When given samples of an overly compacted and non-compacted soil, differentiate between the two and label each. b. List at least three reasons for aerating a green. c. Select, adjust and safely operate equipment commonly used for aeration. d.	4. Observe demonstrations of and practice adjusting and operating aeration equipment typically used to aerate golf course greens. . Observe samples of overly compacted turfs and non-compacted turfs. . While interviewing the golf course superintendent, determine the frequency of aeration required. . ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

TOPICS	RESOURCES
3. Mowing greens a. Guidelines for mowing b. Factors to consider . Frequency . Amount of cut . Height . .... c. Equipment . Selection . Operation . Adjustment . .... d. .... 4. Aerating a green a. Identifying compacted greens b. Reason for aerating c. Equipment . Selection . Adjustment . Operation d.	. Hanson/Juska. Turfgrass Science. . Musser. Turf Management. . PSU. Turf Maintenance and Establishment - A Student Handbook.

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

OBJECTIVES	LEARNING ACTIVITIES
5. Plan and/or conduct a thatch control program for a selected green.	5. As a class project, plan a thatch control program for a typical or selected green.
a. When given a sample of an overly thatched green and samples which are not overly thatched, differentiate and label each.	. Observe samples of overly thatched and non overly thatched turfs.
b. List at least two means of controlling thatch.	. Observe demonstrations of and practice adjusting and safely operating a vertical slicer (mower).
c. Select, adjust and safely operate a vertical slicer (mower).	. Observe demonstrations of the use of top-dressing as a means of controlling thatch.
d.	. ....
6. Plan and/or conduct a watering program for a typical green which is comensurate with industry standards.	6. As a class project, plan and/or conduct a watering program for a typical green.
a. List at least five variables to consider in determining when to water a typical green.	. While interviewing a local golf course superintendent, determine the watering schedule used.
b. Prepare a watering schedule for a typical green of given turfgrass variety which is comensurate with industry standards.	. Prepare a watering schedule for a typical green.
c.	. ....
II.	II. ....

UNIT: Turfgrass Establishment and Maintenance
SUB-UNIT: Turfgrass Maintenance

TOPICS	RESOURCES
5. Controlling thatch buildup a. Identify excessive thatch b. Means of control . Clipping removal . Vertical slicing (mowing) . Top-dressing . .... c. Equipment . Selection . Adjustment . Operation . .... d. .... 6. Watering greens a. Variables involved . Moisture content of soil . Variety of turfgrass . Wind . Relative humidity . Temperature . .... b. Watering schedules c.	. Hanson/Juska. Turfgrass Science. . Musser. Turf Management. . PSU. Turf Maintenance and Establishment - A Student Handbook.
II.	II. ....

RESOURCES

UNIT: Turf Establishment and Maintenance
SUB-UNIT: Turf Maintenance

BOOKS

Musser, H. Burton. Turf Management. NY: McGraw-Hill Book Company, 1962.

Hanson, A.A. and Juska, F.V. Turfgrass Science. Madison, Wisconsin: The American Society of Agronomy, 1969.

Couch, H.B. Diseases of Turfgrasses. Huntington, NY: Robert E. Krieger Publishing Co., Inc., 2nd edition, 1973.

Sunset Editorial Staff. Lawns and Ground Covers, Menlo Park, CA: Lane Books, 1964.

FILMS AND FILMSTRIPS

The Pennsylvania State University, Department of Agricultural Education, University Park, PA 16802.

"Turfgrass Identification" - (30 color slides) Set $5.00

"Types of Turf" - (17 color slides) set $3.00

"Weed Identification" - (37 color slides) set $6.00

STUDENT HANDBOOKS AND TEACHER GUIDES

The Pennsylvania State University, Department of Agricultural Education, University Park, PA 16802.

Turf Maintenance and Establishment - A Student Handbook

Turf Maintenance and Establishment - A Teacher's Guide

TRANSPARENCIES

UNIT: Turf Establishment and Maintenance

SUB-UNIT: Exploring Career Opportunities

OBJECTIVE(S): The student will be able to:

I. Compare and contrast the career opportunities in turf establishment and maintenance.

II. List some of the ways in which a career in this area complements or fails to complement life goals.

III. ....

UNIT: Turf Establishment and Maintenance
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Compare and contrast the career opportunities in turf establishment and maintenance.	I. Interview people employed in careers related to turf establishment and maintenance.
A. List the major career opportunities in turf establishment and maintenance.	. Prepare an in-depth report on at least two occupations in turf establishment and maintenance which are of special interest.
B. Classify the career opportunities as to occupational levels, i.e., professional, technical, etc.	. Perform and/or observe some of the more typical tasks encountered by people employed in the jobs which are of greatest interest to you.
C. List the major competencies required for at least one career related to each of the major occupations.	. Arrange to spend an afternoon or full day with a person employed in this area.
D. List the major activities performed by a person employed in at least one occupation associated with each of the major occupations.	. Seek occupational work experience related to turf establishment and maintenance.
E. List the educational requirements of at least one job.	. If the occupation of your choice requires further schooling, investigate, with the help of your guidance counselor or teacher, the availability of such a school.
F.	. ....

UNIT: Turf Establishment and Maintenance
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
I. Career opportunities in or related to turf establishment and maintenance	I. Local people employed in turf establishment and maintenance.
A. Careers	. Hoover. Handbook of Agricultural Occupations, Chapter XI.
. Turfgrass Grower . Greens Keeper . Grounds Superintendent . Golf Course Superintendent . Agronomist (turfgrass specialist)	. ....
. ....	
B. Occupational classification	
. Owner	
. Manager or Superintendent	
. Worker	
. ....	
C. Competencies needed	
D. Training needed	
E.	

UNIT: Turf Establishment and Maintenance
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
II. List some of the ways in which a chosen career in this area complements or fails to complement life goals.	II. Participate in a class debate of life goals.
A. List the ways in which a chosen career benefits society.	. Prepare a short paper concerning the ways in which a chosen career complements or fails to complement life goals.
B. List the ways in which a chosen career might benefit the student.	. As a class project, prepare a hypothetical radio program. (Each student would select and bring from home a record of his choice. He would then prepare a brief "commercial" on the job of his choice. Then, he would act as a disc jockey as he played a record and gave his job brief as the "commercial.")
C.	. ....
III.	III. ....

UNIT: Turf Establishment and Maintenance
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
II. Career benefits	II. Hoover. Handbook of Agricultural Occupations, Chapters I, II and III.
A. Benefits to society	. VEMC. The World of Work, Activity 9.
B. Benefits to the individual	
C.	
III.	III. ....

RESOURCES

UNIT: Turf Establishment and Maintenance
SUB-UNIT: Exploring Career Opportunities

BOOKS

Hoover, Norman K. *Handbook of Agricultural Occupations*. Danville, ILL: The Interstate Printers and Publishers, Inc., 2nd edition, 1969.

FILMS AND FILMSTRIPS

TEACHER GUIDES

Vocational Education Media Center, 109 Freeman Hall, Clemson University, Clemson, S.C. 29631.

The World of Work - Teacher's Guide

TRANSPARENCIES

Vocational Education Media Center, 109 Freeman Hall, Clemson University, Clemson, S.C. 29631.

The World of Work - Transparencies

UNIT: Landscape Design

SUB-UNIT:

OBJECTIVE(S): The student will be able to:

I. Plan a landscape design for a selected homesite according to industry standards.

  A. Prepare a family needs analysis according to industry standards.

  B. Prepare a site analysis according to industry standards.

  C. Prepare an area layout plan for a selected home landscape according to industry standards.

  D. Prepare a design for the more common landscape structures according to industry standards.

  E. Prepare a planting plan for a selected home landscape according to industry standards.

  F. ....

II. ....

UNIT: Landscape Design
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Plan a landscape design for a selected homesite according to industry standards.	I. As a class, small group or individual project, plan the landscape design to meet the needs of a selected or typical family.
A. Prepare a family needs analysis according to industry standards.	A. If feasible, interview a family in the process of designing a landscape for a home and prepare a needs analysis.
1. List at least five factors to be considered in planning a family needs analysis.	. Simulate the interview using class members and a hypothetical home.
2. Cite at least one reference which provides a Family Needs Checklist.	. Obtain and practice using a prepared Family Needs Checklist.
3.	. ....

UNIT: Landscape Design
SUB-UNIT:

TOPICS	RESOURCES
I. Landscape designing A. Preparing a family needs analysis . Factors to consider . References	. PSU. Landscape Design - A Student Handbook. . Hoover. Approved Practices in Landscaping the Home Grounds. . Harris. Keep'Em Growing. . VEMC. Landscaping the Home and School Grounds. . Robinette. Off the Board/Into the Ground. . Sunset. Landscaping Book. . Clemson University Cooperative Extension Service. Landscape Planning for South Carolina Homes. Circular 526.

UNIT: Landscape Design
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
B. Prepare a site analysis according to industry standards. 1. List at least 10 factors to be considered in preparing a site analysis. 2. Plot the relevant features of the lot to be landscaped on graph paper. 3. Take soil samples and interpret the results of the laboratory report. 4. Determine the slope(s) of a selected lot without the aid of a transit. 5. Cite at least one reference which provides a site analysis checklist. 6.	B. As a class, small group or individual project, prepare a site analysis for a typical home to be landscaped. . Observe demonstrations of and practice plotting the relevant features of the site on graph paper. . Observe demonstrations of and/or practice taking soil samples and interpreting the laboratory report of such tests. . Observe demonstrations of and practice determining slope. . Obtain and practice using a prepared checklist for a site analysis. . ....
C. Prepare an area layout plan for a selected home landscape according to industry standards. 1. List the major components of the area layout plan. 2. List at least five criteria for locating these components on the site analysis plan. 3.	C. As a class, small group or individual project, prepare an area layout plan for a selected home to be landscaped. . Visit homes in the community which have well landscaped and district landscaped areas, i.e., public, private and service areas.

UNIT: Landscape Design
SUB-UNIT:

TOPICS	RESOURCES
B. Preparing a site analysis 1. Factors to consider 2. Plotting relevant features of the site on graph paper 3. Taking soil samples 4. Determining slope 5. References 6.	. PSU. Landscape Design - A Student Handbook, pp. 11-20. . Harris. Keep'Em Growing, Chapter I. . ....
C. Preparing an area layout plan 1. Major components . Public area . Private area . Service area . .... 2. Criteria for evaluating the locations 3.	. PSU. Landscape Design - A Student Handbook, pp. 25-29. . Harris. Keep'Em Growing, Chapter I. . Hoover. Approved Practices in Beautifying the Home Grounds, Chapter I. . VEMC. Landscaping the Home and School Grounds. Also see transparencies for this publication. . ....

UNIT: Landscape Design
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
D. Prepare a structural design for the more common landscape structures according to industry standards.	D. As a class, small group or individual project, prepare a structural design plan for a selected or actual landscape site.
1. List at least three criteria for evaluating the design of walls, walks, patios and drives.	. Visit newly constructed homes in the local community and observe the types of landscape structures under construction.
2. List at least two different types of designs for each of the more common landscape structures.	. Visit established landscapes in the local community and observe the landscape structures commonly used, e.g., terraces, walks, steps, etc.
3. List at least two types of materials for building each of these structures.	. Prepare a bulletin board depicting different types of landscape structures.
	. ....
4. When given a variety of types of walks and drives (straight, curved, wide, narrow, etc.), choose the type which complements a selected landscape situation.	. While visiting well landscaped homes in the local community, note the types, sizes and location of walks and drives.
a. List at least five types of walks and drives.	
b. List at least five criteria for selecting walks and drives.	
c.	

UNIT: Landscape Design
SUB-UNIT:

TOPICS	RESOURCES
D. Preparing the structural plan 1. Criteria for evaluating structural design 2. Types of structural designs 3. Construction materials	. PSU. Landscape Design - A Student Handbook, pp. 64-79. . Hoover. Approved Practices in Beautifying the Home Grounds, Chapter III. . Brimer. Homeowner's Complete Outdoor Building Book. . ....
4. Selecting walks and drives a. Types of walks and drives . Materials . Walks . Brick . Flagstone . Concrete . .... . Gravel . Drives . Concrete . Brick . Asphalt . .... . Forms . Straight . Curved . .... b. Criteria for selecting walks and drives c.	. PSU. Landscape Design - A Student Handbook, pp. 64-66. . Harris. Keep'Em Growing, Chapter I. . Hoover. Approved Practices in Beautifying the Home Grounds. . Brimer. Homeowner's Complete Outdoor Building Book. . VEMC. Landscaping the Home and School Grounds. Also, transparencies for this publication. . Sunset Books: 1. How to Build Decks for Outdoor Living. 2. Sunset Patio Book. 3. How to Build Walls-Walks-Patio Floors. 4. How to Build Fences and Gates. 5. Garden Pools, Fountains and Waterfalls. . ....

UNIT: Landscape Design
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
5. When given a variety of locations for placing a selected walk and/or drive, select the location(s) approved by the instructor. a. List at least five factors to consider in locating walks and drives. b.	

UNIT: Landscape Design
SUB-UNIT:

TOPICS	RESOURCES
5. Selecting the location of walks and drives . Criteria for selection	. PSU. Landscape Design - A Student Handbook, pp. 64-66. . Hoover. Approved Practices in Beautifying the Home Grounds, Chapter VII. . Harris. Keep'Em Growing, Chapter I. . VEMC. Landscaping the Home and School Grounds, Section I. Also transparencies for this publication.

UNIT: Landscape Design
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
E. Prepare a planting plan for the selected home landscape according to industry standards.	E. As a class, small group or individual project, prepare a planting plan for a selected landscape site.
1. List at least five criteria for evaluating a planting plan.	. Observe demonstrations of and practice analyzing landscapes in terms of basic design principles.
2. Analyze a selected planting plan in terms of design.	. Observe demonstrations of and/or practice preparing drawings which illustrate "visual balance."
a. List at least six principles of design.	
b. Analyze a selected planting plan in terms of plant material balance (visual weight)	. Through the use of drawings, or by observing actual landscapes, illustrate rhythm in design.
c. Analyze a selected planting plan in terms of rhythm.	
d. Analyze a proposed landscape in terms of scale.	. Through the use of drawings or other illustrative materials, illustrate the principle of scale.
e. Analyze a proposed landscape plan in terms of style.	. While studying landscape design through field trips, classify landscapes as to style, e.g., formal, informal, etc.
f. Analyze a proposed landscape plan in terms of color sequence or succession.	
g. Analyze a proposed landscape plan in terms of it being functional.	. Prepare four copies of a selected landscape and color each according to the actual color during each of the four seasons.
h.	. ....

UNIT: Landscape Design
SUB-UNIT:

TOPICS	RESOURCES
E. Preparing a planting plan 1. Criteria for evaluating 2. Analyzing in terms of design principles a. Design principles . Balance . Rhythm . Scale . .... b. Analyzing in terms of balance c. Analyzing in terms of rhythm d. Analyzing in terms of scale e. Analyzing in terms of style . Formal . Informal . .... f. Analyzing in terms of color succession g. Analyzing a plan in terms of usefulness h.	. PSU. Landscape Design - A Student Handbook, pp. 30-61 also pp. 91-97. . Harris. Keep'Em Growing, Chapter II. . Hoover. Approved Practices in Beautifying the Home Grounds, Chapter II. . VEMC. Landscaping the Home and School Grounds, Section I. Also transparencies for this publication. . ....

UNIT: Landscape Design
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
3. Interpret a scale drawing showing the proposed planting plan of the public area of a home which is acceptable to the instructor.	3. As a class, small group or individual project, practice interpreting a planting plan for the public area of a typical or actual landscape site
a. List at least five criteria for evaluating the landscape design of the public area of a home.	. Obtain actual planting plans drawn by a landscape architect and observe demonstrations of and practice interpreting such plans.
b. List at least five factors to consider in landscaping the public area.	
c. List the major components of the typical public area of a home landscape, e.g., front of home, open lawn, corner planting, etc.	

UNIT: Landscape Design
SUB-UNIT:

TOPICS	RESOURCES
3. Interpreting the planting plan for the public area.	. PSU. Landscape Design - A Student Handbook, pp. 33-50 also pp. 91-97.
a. Criteria for evaluating the design . Focal point . Balance . Scale	. PSU. Landscape Design - A Student Handbook, pp. 30-33.
b. Factors to be considered . Distance from street or road . Front view	. PSU. Landscape Design - A Student Handbook, pp. 33-50.

c. Components of the public area
. Structures
  . Drives
  . Walks
  . Fences
  . ....
. Trees
  . Specimen trees
  . Framing trees
  . ....
. Corner plantings
. Ground covers
. ....
	. PSU. Landscape Design - A Student Handbook, pp. 33-50.

UNIT: Landscape Design
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
d. When given a variety of tree species and forms (columnar, rounded, weeping, spreading, etc.) select the species and form(s) which best complement a given landscape.	. Prepare a bulletin board display of the major tree forms. . Obtain and use references which list trees by climatic adaptation, form, height, deciduous - evergreen, etc. . ....
1. List at least two criteria for selecting tree species and forms.	
2. List at least one desirable species of each form available and adapted to your area.	
3. Cite at least one reference which lists trees by height, form and other characteristics.	
4.	
e. When given a selected home landscape situation, place the tree(s) so as to "frame the home landscape picture."	. Prepare drawings or flannel board displays showing the correct use of trees for framing a typical or selected home.
1. List at least two criteria for choosing the location of trees in the public area.	. While visiting local homes, observe the "framing effect" of large trees.
2. When given trees of varying height, place them in a manner which will result in the formation of the focal point at the door of the home.	. Observe demonstrations (perhaps by drawings or flannel board) illustrating the proper location of trees to enhance the formation of a focal point.
. ....	. ....

UNIT: Landscape Design
SUB-UNIT:

TOPICS	RESOURCES
d. Selecting trees 1. Criteria for selection . Shape . Type (deciduous-evergreen) . Size . Rate of growth . Height . .... 2. Locally adapted species 3. References 4.	. PSU. *Landscape Design - A Student Handbook*, pp. 33-50 also pp. 82-91. . Hoover. *Approved Practices in Beautifying the Home Grounds*, pp. 37-41. . Harris. *Keep'Em Growing*, Chapter II. . ....
e. Placing the trees 1. Criteria for locating trees . Esthetics . Framing effect . Specimen . Screening effect . .... . Usefulness . Wind break . Shade . Screen . .... 2. Using trees to enhance the formation of a focal point	. PSU. *Landscape Design - A Student Handbook*, pp. 33-50 also pp. 82-91. . Hoover. *Approved Practices in Beautifying the Home Grounds*, pp. 37-41. . Harris. *Keep'Em Growing*, Chapter II. . VEMC. *Landscaping the Home and School Grounds*, Section I. Also transparencies for this publication. . ....

UNIT: Landscape Design
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
f. When given a variety of species, forms and sizes of landscape shrubs, design a recommended corner planting for a selected home landscape.	. As a class, small group or individual project, prepare a corner planting plan for a typical or actual landscape site.
1. List at least two criteria for designing a typical corner planting.	. Obtain and use a reference which describes shrubs commonly used for corner planting.
2. List at least five evergreen and five deciduous shrubs suitable for corner plantings and adaptable in the local area.	. While visiting local homes to observe landscaping observe the plant materials used for corner plantings and their placement.
3. Cite at least one reference which lists shrubs commonly used for corner plantings by form, size, climatic adaptability, deciduous- evergreen, etc.	. ....
4.	

UNIT: Landscape Design
SUB-UNIT:

TOPICS	RESOURCES
f. Planning the ground cover design 1. Criteria for evaluating ground cover design a. Tying effect b. Color c. Texture d. .... 2. Species of ground covers locally adapted 3. References 4.	. PSU. Landscape Design - A Student Handbook, pp. 33-34, pp. 33-50 and pp. 82-91. . Hoover. Approved Practices in Beautifying the Home Grounds, pp. 41-44. . ....

UNIT: Landscape Design
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
g. When given a variety of species, forms and sizes of ground cover plants, design a ground cover planting for a selected home.	. As a class, small group or individual project, design a ground cover planting for a given or selected home site.
1. List at least two criteria evaluating ground cover use.	. While visiting landscape sites in the local community, observe the types and uses of ground covers.
2. List at least five species of ground covers adapted in the local area.	. Obtain and use references which provide the major characteristics of the more commonly used and locally adapted ground cover plants.
3. Cite at least one reference which lists the major characteristics of the more commonly used and locally adapted ground covers.	. ....
4.	
h.	

UNIT: Landscape Design
SUB-UNIT:

TOPICS	RESOURCES
g. Selecting ground cover plants	. PSU. Landscape Design - A Student Handbook, pp. 33-50, pp. 82-91 and Appendix C pp. 33-34.
1. Criteria for selecting ground covers . Adaptability . Size . Color . Texture	
2. Species of ground cover	
3. Reference to ground covers	
4.	
h.	. ....

UNIT: Landscape Design
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
4. Interpret a scale drawing of a proposed design for the private area of a home landscape. a. List at least three criteria for evaluating the design of the private area. b. List at least five factors to consider in landscaping the private area. c. List the major components of the private area of a typical home landscape, e.g., patio, screens, picnic tables, etc. d.	. As a class, small group or individual project, interpret a landscape design for the private area of a typical home site. . While visiting landscape sites in the local community, observe the design of the private area. . Obtain and practice interpreting plans which were drawn by a landscape architect. . ....

UNIT: Landscape Design
SUB-UNIT:

TOPICS	RESOURCES
4. Interpreting the design for the private area a. Criteria for evaluating . Aesthetics . Comfort . Usefulness . .... b. Factors to consider c. Typical components . Terrace or patio . Game area . Specimen trees, shrubs and flowers . Picnic tables . Outdoor grill . .... d.	. PSU. Landscape Design - A Student Handbook, pp. 50-58. . Harris. Keep'Em Growing, Chapter II. . Hoover. Approved Practices in Beautifying the Home Grounds, pp. 34-35. . VEMC. Landscaping the Home and School Grounds, Section I. Also transparencies for this publication.

UNIT: Landscape Design
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
5. Interpret a scale drawing of a proposed design for the service area of a home landscape. a. List at least three criteria for evaluating the design of the service area. b. List at least three factors to consider in landscaping the service area. c. List the major components of a typical service area of a home landscape, e.g., garbage cans, tool sheds, clothes lines, etc.	. As a class, small group or individual project, interpret a landscape design for the service area of a typical home site. . While visiting landscape sites in the local community, observe the design of the service areas. . Obtain and practice interpreting landscape plans which were developed by a landscape architect. . ....

UNIT: Landscape Design
SUB-UNIT:

TOPICS	RESOURCES
5. Interpreting a design for the service area a. Criteria for evaluating the design . Aesthetics . Usefulness . .... b. Factors to consider c. Components . Home garden . Clothes line . Tool sheds . Garbage cans	. PSU. Landscape Design - A Student Handbook, pp. 58-61. . Harris. Keep'Em Growing, Chapter II. . Hoover. Approved Practices in Beautifying the Home Grounds, p. 35. . VEMC. Landscaping the Home and School Grounds, Section I. Also transparencies for this publication. . ....

RESOURCES

UNIT: Landscape Design
SUB-UNIT:

BOOKS

Brimer, John Burton. Homeowner's Complete Outdoor Building Book. New York: Popular Science Publishing Company, Harper and Row, 1971.

Harris, John H. and Halfacre, Gordon R. Keep'Em Growing. Raleigh, NC: Litho Industries, Inc., 1972.

Hoover, Norman K. Approved Practices in Beautifying the Home Grounds. Danville, ILL: The Interstate Printers and Publishers, Inc.

Robinette, Gary O. Off the Board/Into the Ground. Washington, D. C.: The American Association of Nurserymen.

Lane Magazine and Book Company.
Menlo Park, California.

- How to Build Decks for Outdoor Living
- Sunset Patio Book
- How to Build Walks, Walls and Patio Floors.
- How to Build Fences and Gates
- Garden Pools, Fountains and Waterfalls

STUDENT HANDBOOKS

The Pennsylvania State University, Department of Agricultural Education, University Park, Penn.

Landscape Design - A Student Handbook

Landscape Design - A Teacher's Guide

Vocational Education Media Center in cooperation with the State Department of Education, Clemson University, Clemson, S.C. 29631.

Landscaping the Home and School Grounds

TRANSPARENCIES

Vocational Education Media Center, Clemson University, Clemson, S.C. 29631.

"Landscaping the Home and School Grounds"

BULLETINS

Clemson University Cooperative Extension Service, Clemson, S. C.:
Landscape Planning for South Carolina Homes.
Circular 526 - Revised February, 1974.

UNIT: Landscape Design

SUB–UNIT: Exploring Career Opportunities

OBJECTIVE(S): The student will be able to:

I. Compare and contrast the career opportunities in landscape design.

II. List some of the ways in which a career in this area complements or fails to complement life goals.

III. ....

UNIT: Landscape Design
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Compare and contrast the career opportunities in landscape design.	I. Interview people employed in careers related to landscape design.
A. List the major career opportunities in landscape design.	. Prepare an in-depth report on at least two occupations in landscape design which are of special interest.
B. Classify the career opportunities as to occupational levels, i.e., professional, technical, etc.	. Perform and/or observe some of the more typical tasks encountered by people employed in the jobs which are of greatest interest to you.
C. List the major competencies required for at least one career related to each of the major occupations.	. Arrange to spend an afternoon or full day with a landscape designer.
D. List the major activities performed by a person employed in at least one occupation associated with each of the major occupations.	. Seek occupational work experience on a landscape.
E. List the educational requirements of at least one job in each of the major occupations.	. If the occupation of your choice requires further schooling, investigate, with the help of your guidance counselor or teacher, the availability of such a school.
F.	. ....

UNIT: Landscape Design
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
I. Career opportunities in or related to landscape design A. Careers . Landscape Architect . Landscape Designer . Landscape Nurseryman . Draftsman . .... B. Occupational classification . Landscape Architect . Landscape Designer . Landscape Nurseryman . Draftsman . .... C. Competencies needed D. Training needed E.	I. Local people employed in landscape design. . Hoover. Handbook of Agricultural Occupations, Chapter XI. . ....

UNIT: Landscape Design
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
II. List some of the ways in which a chosen career in this area complements or fails to complement life goals.	II. Participate in a class debate of life goals.
A. List the ways in which a chosen career benefits society.	. Prepare a short paper concerning the ways in which a chosen career complements or fails to complement life goals.
B. List the ways in which a chosen career might benefit the student.	. As a class project, prepare a hypothetical radio program. (Each student would select and bring from home a record of his choice. He would then prepare a brief "commercial" on the job of his choice. Then, he would act as a disc jockey as he played a record and gave his job brief as the "commercial".)
C.	
III.	III. ....

UNIT: Landscape Design
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
II. Career benefits	II. Hoover. Handbook of Agricultural Occupations, Chapters I, II and III. . VEMC. Exploring the World of Work, Activity 9.
A. Benefits to society	
B. Benefits to the individual	
C.	
III.	III. ....

RESOURCES

UNIT: Landscape Design
SUB-UNIT: Exploring Career Opportunities

BOOKS

Hoover, Norman K. Handbook of Agricultural Occupations. Danville, ILL: The Interstate Printers and Publishers, Inc., 2nd edition, 1969.

FILMS AND FILMSTRIPS

TEACHER GUIDES

Vocational Education Media Center, 109 Fréeman Hall, Clemson University, Clemson, S.C. 29631.

The World of Work - Teacher's Guide

TRANSPARENCIES

Vocational Education Media Center, 109 Fréeman Hall, Clemson University, Clemson, S.C. 29631.

The World of Work - Transparencies

UNIT: Landscape Establishment and Maintenance

OBJECTIVE(S): The student will be able to:

I. When given a selected landscape, plan and prepare the site.

II. Establish selected nursery plants at typical landscape site.

III. Prune selected trees and shrubs.

IV. Plan a pest control program for selected plants.

V. Plan a recommended fertilization program for a selected shrub or tree planting.

VI. Build the structures typically called for in landscape plans.

VII. ....

UNIT: Landscape Establishment and Maintenance
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. When given a selected landscape, plan and prepare the site.	I. Observe a site being prepared and/or participate in the preparation of a landscape site.
A. Read and interpret a typical landscape blueprint or plan.	A. Practice reading and interpreting landscape blueprints or plans.
B. Layout a typical landscape plan.	B. As a class project, layout a typical landscape plan.
1. Use a transit	. Observe demonstrations of and practice using the transit and land tape.
2. Measure with a land tape	
3.	. ....
C. Perform the final grading of a typical landscape site (hand equipment).	C. Observe site grading being done by large equipment.
	. As a class project, grade a project which requires minor grading with hand tools or equipment.
D.	D. ....

UNIT: Landscape Establishment and Maintenance
SUB-UNIT:

TOPICS	RESOURCES
I. Preparing the landscape site A. Reading and interpreting the blueprint or plan B. Laying out the plan . Using the transit . Measuring with a land tape . .... C. Grading the site D.	I. PSU. Landscape Design. . Brooklyn Botanical Gardens. Handbook on Garden Construction. . Robinette. Off the Board/Into the Ground. . Clemson University Extension Service. Landscape Planning for South Carolina Homes - Circular 526. . VEMC. Landscaping the Home and School Grounds.

UNIT: Landscape Establishment and Maintenance
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
II. Establish selected shrub, tree, and ground cover plant(s) at a landscape site.	II. As a class, small group or individual project, establish a landscape planting.
A. Diagram or otherwise describe the planting procedures.	. Obtain and use prepared drawings or prepare drawings depicting the proper planting of landscape plants.
B. List at least six criteria for evaluating a correctly established plant.	
C. Select, adjust and safely operate hole digging equipment.	. Observe demonstrations of and/or practice operating hole digging equipment.
D. State a rule-of-thumb for selecting a hole diameter and depth.	
E. Select and prepare a recommended soil mixture for a chosen planting.	. Observe demonstrations of and/or prepare a soil mixture for a selected planting.
1. Cite at least one reference which gives a recommended mixture.	
2. List at least one typically recommended mixture.	
3.	
F. Prepare a watering schedule for establishing a selected planting.	
G.	. ....

UNIT: Landscape Establishment and Maintenance
SUB-UNIT:

TOPICS	RESOURCES
II. Establishing nursery plants	II. PSU. Landscape Maintenance and Establishment.
A. Planting procedure	. American Association of Nurserymen. . ....
B. Criteria for evaluating planting	
C. Equipment . Selection . Adjustment . Operation	
D. Determining hole size	
E. Preparing the soil mixture . References . Mixtures	
F. Preparing a watering schedule	
G.	

UNIT: Landscape Establishment and Maintenance
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
III. Prune selected trees and shrubs.	III. As a class, small group or individual project, prune a variety of plants used for landscape purposes.
A. List at least five criteria for evaluating the pruning of a selected shrub.	. Observe demonstrations of and/or practice pruning various types of shrubs and trees.
B. List at least five reasons for pruning.	. Obtain and file reference(s) which provide recommended pruning dates for selected shrubs and trees.
C. Cite at least one reference which lists recommended pruning dates for a selected shrub or tree.	. Observe demonstrations of and/or practice operating tools and equipment typically used for pruning.
D. Select, adjust and operate typically used pruning tools or equipment.	
E. Treat pruning cut to prevent rot or insect damage.	. Observe a demonstration of and/or practice treating a pruning cut to prevent rot or insect damage
F.	. ....

UNIT: Landscape Establishment and Maintenance
SUB-UNIT:

TOPICS	RESOURCES
III. Pruning A. Criteria for evaluating B. Reasons for pruning C. Determining appropriate time for pruning D. Equipment . Selection . Adjustment . Operation . .... E.	III. PSU. *Landscape Maintenance and Establishment*. . Hoover. *Approved Practices in Beautifying the Home Grounds*. . VEMC. *Landscaping the Home and School Grounds*. . ....

UNIT: Landscape Establishment and Maintenance
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
IV. Plan a pest control program for a selected plant(s).	IV. As a class project, plan a pest control program for a selected landscape planting.
A. With the aid of appropriate references, identify the more common shrub or tree insects and diseases or symptoms of such insects and diseases.	. Practice identifying various landscape plant pests using selected references.
B. Cite at least one reference helpful in identifying the more common insects and diseases of shrubs and trees.	. Obtain and use a reference(s) which provides pest identification and control chemicals or procedures.
C. Cite at least one reference which gives recommended insect and disease control measures and schedules.	. Observe demonstrations of the calibration and safe operation of the typically used pest control equipment.
D. Select, adjust, calibrate and safely operate the more commonly used spray equipment used for insect and disease control.	. ....
E.	

UNIT: Landscape Establishment and Maintenance
SUB-UNIT:

TOPICS	RESOURCES
IV. Planning a pest control program A. Pest identification . Insects . Diseases . .... B. Reference related to identification C. References related to control measures and spray schedules D. Equipment . Selection . Adjustment . Calibration . Operation . .... E.	IV. PSU. Landscape Maintenance and Establishment. . Hoover. Approved Practices in Beautifying the Home Grounds. . ....

UNIT: Landscape Establishment and Maintenance
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
V. Plan a recommended fertilization program for a selected shrub or tree planting.	V. As a class project, plan a recommended fertilization program for a selected shrub or tree planting.
A. Cite at least one reference which gives typical fertilizer requirements or schedules for a selected shrub or tree.	. Obtain and file a reference(s) which provides fertilizer recommendations.
B. Select a recommended method of application.	. Observe demonstrations of the adjustment and operation or use of fertilizer application tools or equipment.
C. Select, adjust, calibrate and correctly use typical tools or equipment used for applying fertilizer.	
D. Identify fertilizer burn.	. Observe demonstrations of fertilizer burn.
E.	. ....

UNIT: Landscape Establishment and Maintenance
SUB-UNIT:

TOPICS	RESOURCES
V. Planning a fertilization program	V. PSU. Landscape Maintenance and Establishment.
A. References	. ....
B. Methods	
C. Equipment . Selection . Adjustment . Calibration . Operation	
D. Burn identification	
E.	

UNIT: Landscape Establishment and Maintenance
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
VI. Build the structures typically called for in landscape plans.	VI. As a class project, construct a typical patio or walk.
A. Construct a simple but typical patio or walk.	. Simulate the construction of a patio(s) using a variety of materials.
B. Construct a typical wall.	. Simulate the construction of typical walls using a variety of materials.
C.	. ....
VII.	VII. ....

UNIT: Landscape Establishment and Maintenance
SUB-UNIT:

TOPICS	RESOURCES
VI. Building landscape structures	VI. PSU. *Landscape Maintenance and Establishment*.
A. Constructing a patio or walk	. Hoover. *Approved Practices in Beautifying the Home Grounds*, Chapter III.
B. Constructing a wall	. ....
C.	. ....
VII.	VII. ....

RESOURCES

UNIT: Landscape Establishment and Maintenance

SUB-UNIT:

BOOKS

Hoover, Norman K. Approved Practices in Beautifying the Home Grounds. Danville, ILL: The Interstate Printers and Publishers, Inc.

Brooklyn Botanical Gardens. Handbook on Garden Construction. Brooklyn, NY.

Vocational Education Media Center. Landscaping the Home and School Grounds. Clemson, S. C.: The center in cooperation with the State Department of Education.

FILMS AND FILMSTRIPS

STUDENT HANDBOOKS/TEACHER GUIDES

The Pennsylvania State University, Department of Agricultural Education, University Park, Penn. 16802.

Landscape Design - A Student Handbook

Landscape Design - A Teacher's Guide

BULLETINS

Clemson University Cooperative Extension Service, Clemson, S. C.:

Landscape Planning for South Carolina Homes - Circular 526 - Revised February 1974.

TRANSPARENCIES

UNIT: Landscape Establishment and Maintenance

SUB-UNIT: Exploring Career Opportunities

OBJECTIVE(S): The student will be able to:

I. Compare and contrast the career opportunities in landscape establishment and maintenance.

II. List some of the ways in which a career in this area complements or fails to complement life goals.

III. ....

UNIT: Landscape Establishment and Maintenance
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Compare and contrast the career opportunities in landscape establishment and maintenance.	I. Interview people employed in careers related to landscape establishment and maintenance.
A. List the major career opportunities in landscape establishment and maintenance.	. Prepare an in-depth report on at least two occupations in landscape establishment and maintenance which are of special interest.
B. Classify the career opportunities as to occupational levels, i.e., professional, technical, etc.	. Perform and/or observe some of the more typical tasks encountered by people employed in the jobs which are of greatest interest to you.
C. List the major competencies required for at least one career related to each of the major occupational areas.	. Arrange to spend an afternoon or full day with a person employed in landscape establishment and maintenance.
D. List the major activities performed by a person employed in at least one occupation associated with each of the major occupational areas.	. Seek occupational work experience in landscape establishment and maintenance.
E. List the educational requirements of at least one job in each of the major occupational areas.	. If the occupation of your choice requires further schooling, investigate, with the help of your guidance counselor or teacher, the availability of such a school.
F.	. Arrange to visit a commercial site which is being established by a landscape architect.
	. ....

UNIT: Landscape Establishment and Maintenance
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
I. Career opportunities in or related to landscape establishment and maintenance	I. Local people employed in cash crop farming
A. Careers	. Hoover. Handbook of Agricultural Occupations, Chapter XI.
. Landscape Nurseryman	. ....
. Landscape Contractor	
. Landscape Worker	
. ....	
B. Occupational classification	
. Owner	
. Manager	
. Worker	
. ....	
C. Competencies needed	
D. Training needed	
E.	

UNIT: Landscape Establishment and Maintenance
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
II. List some of the ways in which a chosen career in this area complements or fails to complement life goals.	II. Participate in a class debate of life goals.
A. List the ways in which a chosen career benefits society.	. Prepare a short paper concerning the ways in which a chosen career complements or fails to complement life goals.
B. List the ways in which a chosen career might benefit the student.	. As a class project, prepare a hypothetical radio program. (Each student would select and bring from home a record of his choice. He would then prepare a brief "commercial" on the job of his choice. Then, he would act as a disc jockey as he played a record and gave his job brief as the "commercial".)
C.	. ....
III.	III. ....

UNIT: Landscape Establishment and Maintenance
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
II. Career benefits	II. Hoover. *Handbook of Agricultural Occupations*, Chapter XI.
A. Benefits to society	. VEMC. *The World of Work - A Teacher's Guide*, Activity 9. . ....
B. Benefits to the individual	
C.	
III.	III. ....

RESOURCES

UNIT: Landscape Establishment and Maintenance
SUB-UNIT: Exploring Career Opportunities

BOOKS

Hoover, Norman K. Handbook of Agricultural Occupations. Danville, ILL: The Interstate Printers and Publishers, Inc., 2nd edition, 1969.

FILMS AND FILMSTRIPS

TEACHER GUIDES

Vocational Education Media Center, 109 Freeman Hall, Clemson University, Clemson, S.C. 29631.

The World of Work - A Teacher's Guide

TRANSPARENCIES

Vocational Education Media Center, 109 Freeman Hall, Clemson University, Clemson, S.C. 29631.

The World of Work - Transparencies

UNIT: Flower Shop and Garden Center Operation and Management

SUB-UNIT: Retail Flower Shop Operation and Management

OBJECTIVE(S): The student will be able to:

I. Plan the operation and management of a typical retail flower shop.

  A. Plan a recommended management program for a typical retail flower shop.

  B. Perform some of the more typical tasks required of retail flower shop sales persons in a manner acceptable to the industry.

  C. Plan and use a simple record keeping system for a typical retail flower shop.

  D. Perform selected tasks frequently performed by the retail flower shop designer.

  E. ....

II. ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Plan the operation and management of a typical retail flower shop.	I. As a class project, plan the operation and management of a typical retail flower shop.
A. Plan a recommended management program for a typical retail flower shop.	A. With the help and permission of the staff of a flower shop, "take over" a retail flower shop for a day.
1. Select a recommended location for a retail flower shop. a. List at least five criteria for selecting a profitable location. b.	. Seek occupational work experience in a local retail flower shop. . .... 1. While visiting local flower shops, note locations in relation to other types of businesses, accessibility to walking customers, driving customers, etc.
2. Select a recommended stock inventory for a given shop size and location. a. List the major types of stock typically carried in a retail flower shop, e.g., pot flowers, cut flowers, ceramics, artificial arrangements, etc. b. List at least one source of help in planning a stock inventory. c.	2. Visit local retail flower shops and note the categories of stock offered. . Invite a local retail florist and/or wholesale florist sales representative to visit the class and discuss a recommended stock inventory for a typical retail flower shop. . Obtain and use suggested stock inventory guides provided by wholesale florist businesses. . ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

TOPICS	RESOURCES
I. Planning the operation and management of a retail flower shop	I.
A. Planning a management program	A.
1. Selecting a location	1. Pfahl. The Retail Florist Business, Chapter 11.
a. Criteria for selecting	. PSU. Retail Flower Shop Operation and Management, Problem Area 6.
b.	. Magazine. Southern Florist.
	. ....
2. Selecting the stock inventory	. Pfahl. The Retail Florist Business, Chapter 13.

a. Types of stock
. Cut flowers
. Pot Plants
. Arrangements
  . Real
  . Artificial
. Specialty items
  . Ceramics
  . Cards
  . Others
. ....
	. PSU. Retail Flower Shop Operation and Management, Problem Area 6.
	. ....

b. Reference on stock inventory	
c.	

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
3. Diagram a recommended floor plan for a hypothetical flower shop for a given set of conditions.	3. While visiting local flower shops, note the floor plan and approximate space in each area of the shop.
a. List the minimum recommended size showroom, office, design area, and storage area (temporary, permanent).	. Obtain recommended floor plans from florist associations such as FTD or SAF.
b. Select recommended sizes and types of display refrigerators needed.	. If feasible (some area vocational centers have done so) construct a small retail flower shop at the school. Some schools have made this an adjunct to the greenhouse or shop.
c. Cite at least one reference which provides recommended floor plans for typical retail flower shops.	
4. Select a recommended staff for a typical retail flower shop.	4. While visiting local flower shops, note the different job positions, e.g., salesperson, bookkeeper, designer, deliveryman, etc.
a. List the job titles of employees typically working in a retail flower shop.	. Interview workers employed in various job positions to determine tasks performed, competencies needed, etc.
b. List the major duties performed and competencies needed, etc., for each worker in a typical retail flower shop.	. ....
c.	

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

TOPICS	RESOURCES
3. Preparing a shop floor plan a. Minimum area required . Showroom . Design area . Office . Storage . .... b. Selecting display refrigerators c. Reference to recommended floor plans	3. Pfahl. The Retail Florist Business, Chapter 10. . PSU. Retail Flower Shop Operation and Management, Problem Area 6.
4. Selecting a staff a. Job titles . Manager and/or owner . Sales person . Bookkeeper . Designer . Deliveryman . .... b. Duties performed and competencies needed c.	4. Pfahl. The Retail Florist Business, Chapter 12. . ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
5. Select the services to be offered by a typical retail flower shop.	5. While visiting local flower shops, note the types of services offered.
a. List the major services offered by a typical retail flower shop.	. Interview as a class or have a class member interview a local florist to determine the types of services offered.
b. Rank typical services offered by volume and profit.	. While interviewing a local florist, ask him or her to rank components of the business by volume and by profit.
c.	. ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

TOPICS	RESOURCES
5. Selecting services to be performed	5. Pfahl. *The Retail Florist Business*, Chapter 3.
a. Major services	. ....
. Flower sales	
. cut	
. pot	
. ....	
. Arrangement sales	
. Artificial	
. Real	
. Home and hospital	
. Wedding	
. Bouquets	
. Corsages	
. Boutonnieres	
. Funeral	
. Sprays	
. Baskets	
. ....	
. Specialty item sales	
. Specialty services	
. Wedding director	
. ....	
b. Ranking services by volume and profit	
c.	

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
6. Prepare a sales volume calendar by major items for a typical retail flower shop. a. Prepare a florists' calendar of special sales dates, e.g., Easter, Mother's Day, Christmas, etc. b. Cite at least one source of such calendars. c.	6. Obtain typical florist calendars from a local florist. . As a class project, prepare a calendar of holidays or other special dates on which special flowers are typically sold, e.g., Christmas - poinsettias, Easter - Easter lilies, etc. . ....
7.	7. ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

TOPICS	RESOURCES
6. Preparing the sales volume calendar	6. Pfahl. The Retail Florist Business, Chapter 38. . PSU. Retail Flower Shop Operation and Management. . ....
a. Florist's calendar	
b. References	
c.	
7.	

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
B. Perform some of the more typical tasks required of flower shop salespersons in a manner acceptable by the industry.	B. Ideally each student would receive occupational work experience as a salesperson in a flower shop.
1. Wait on a typical customer.	1. Role play salesperson and customer.
a. List the major steps in a typical sales.	. Observe demonstrations of and/or practice waiting on a customer.
b. Operate a typical cash register.	. Observe demonstrations of and/or practice operating a typical cash register.
c. Fill out a typical sales slip.	. Observe demonstrations of and/or complete a typical sales slip.
d. Advise a customer concerning the selection of a typical cut flower, floral design, pot plant or other gift items.	. ....
e. Wrap a typical item for a customer, e.g., cut flowers, pot plants, novelty items, arrangements, etc.	. Observe demonstrations of and/or practice wrapping typical stock items.
f. Identify all items of stock.	. Practice (perhaps through identification contest) identifying the more commonly sold stock items, e.g., cut flowers, flower arrangements, pot plants, ceramic items, etc.
g.	. ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

TOPICS	RESOURCES
B. Performing sales tasks	B. Pfahl. The Retail Florist Business, Chapter 17.
	. PSU. Retail Flower Shop Operation and Management, Problem Area 5.
1. Waiting on a customer	. ....
a. Major steps in selling	
b. Operating the cash register	
c. Filling out a sales slip	
d. Advising customers	
e. Wrapping items	
f. Identifying stock	
g.	

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
C. Plan and use a simple record keeping system for a typical flower shop. 1. List at least five functions of a recommended record keeping system. 2. List at least five types of records needed. 3. Post a payment in a typical accounts receivable record. 4. Post a bill in a typical accounts payable record. 5.	C. As a class project, set up a simple bookkeeping system for a typical retail flower shop. . Invite the bookkeeper or manager from a local flower shop to explain the record keeping system used. . ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

TOPICS	RESOURCES
C. Planning the record keeping system 1. Functions of the system 2. Types of records needed a. Accounts receivable . Owed . Paid b. Accounts payable c. General ledger d. .... 3. Posting payments 4. Posting bills 5.	C. Pfahl. *The Retail Florist Business*, Chapter 25. . PSU. *Retail Flower Shop Operation and Management*, Problem Area 6. . ....

OBJECTIVES	LEARNING ACTIVITIES
D. Perform selected tasks frequently performed by the retail flower shop designer.	D. Interview a retail flower shop designer in the local area.
	. ....
1. With the aid of prepared drawings, assemble a typical home, hospital, wedding or funeral design.	1. Observe demonstrations of and/or practice constructing typical flower arrangements.
a. List the major principles of flower arrangements, e.g., design, balance, scale, etc.	. Observe demonstrations illustrating the major principles of flower design.
b. List the major elements of design, e.g., line, form, etc.	. Observe demonstrations illustrating the major elements of design.
c. List the major types of color harmony, e.g., complementary, monochromatic, etc.	. Observe demonstrations illustrating color harmony through the use of the color wheel.
d. Demonstrate the recommended use of the color wheel for attaining color harmony.	
e.	
2. Construct a typical home or hospital arrangement as approved by the industry.	2. Observe demonstrations of and/or prepare typical home or hospital arrangements using at least five basic designs.
a. Identify and label at least five of the basic designs when shown pictures or drawings of such designs.	. Invite a local flower designer to demonstrate flower arrangements.

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

TOPICS	RESOURCES
D. Preparing flower arrangements 1. Constructing arrangments a. Principles of flower design b. Elements of design c. Types of color harmony d. Use of the color wheel e.	D. Pfahl. The Retail Florist Business, Chapters 27, 28 and 29. . PSU. Retail Flower Shop Operation and Management, Problem Area 3.
2. Constructing a home or hospital arrangement a. Basic designs 1. Horizontal 2. Hogarth 3. Symmetrical 4. Asymmetrical 5. Vertical 6. Oval 7.	2. Pfahl. The Retail Florist Business, Chapter 30. . PSU. Retail Flower Shop Operation and Management, Problem Area 3. . PSU. Slide Series - "Designing With Flowers and Decorative Materials." . Smithers - Oasis. "Adventure With Flowers." . ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
b. List the basic materials needed for a selected design.	. Prepare a pictorial display illustrating the types of containers typically used.
c. List the major steps in the construction of a selected design.	. Prepare a pictorial display of the major types of holding devices typically used.
d. Identify and label at least five basic types of containers when shown pictures or drawings of such containers.	
e. Identify at least five types of holding devices when shown pictures or drawings of such devices.	
f. Identify and label at least five foliages commonly used in constructing flower arrangements.	. Prepare a pictorial display of the major types of foliages used for constructing flower arrangements.
g. Identify and label at least three spike type flowers commonly used in constructing arrangements.	. Prepare a pictorial display of the major spike type flowers commonly used in constructing arrangements.
h. Identify and label at least five globular type flowers commonly used in constructing arrangements.	. Prepare a pictorial display of the major globular type flowers commonly used in constructing flower arrangements.
i.	. ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

TOPICS	RESOURCES
b. Materials needed c. Steps d. Types of containers . Cylinders . Pedestals . Vases . Bowls . Trays e. Holding devices . Pin . Wire . Clay . Hydrofoam . .... f. Types of foliages . Bakerfern . Podocarpus . Huckleberry . Eucalyptus . Ivy . Salal . Laurel . .... g. Spike type flowers . Gladiolas . Snapdragon . Stock . .... h. Globular type flowers . Carnations . Chrysanthemums . Aster . Hydrangea . Geranium . .... i.	. Pfahl. The Retail Florist Business, Chapter 30. . PSU. Retail Flower Shop Operation and Management, Problem Area 3. . PSU. Slide Series - "Designing With Flowers and Decorative Materials." . Smithers - Oasis. "Adventure With Flowers." . ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
3. Construct a typical corsage and boutonniere which would be acceptable to the industry.	3. Observe demonstrations of and/or practice constructing typical corsages and boutonnieres.
a. Identify and label at least five flowers commonly used for making corsages or boutonnieres.	. Prepare a pictorial display of flowers typically used for corsages or boutonnieres.
b. Identify and label at least five foliages frequently used in preparing corsages.	. Observe a demonstration of and/or practice tying a ribbon for use on a corsage.
c. List at least five accessories frequently used in constructing corsages or boutonnieres, e.g., ribbon, netting, wire, pins, etc.	. Observe a demonstration of wiring and taping flowers to be used in a typical corsage or boutonniere.
d. Tie a ribbon using industry recommended procedures.	. ....
e. Wire and tape a flower to be used on a typical corsage or boutonniere.	
f. List the major steps involved in constructing a corsage or boutonniere.	
g.	

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

TOPICS	RESOURCES
3. Constructing corsages and boutonnieres a. Identifying flowers used for corsages and boutonnieres b. Identifying foliages used for corsages c. Accessories . Ribbon . Netting . Wire . Pins . Water tubes . .... d. Tying a ribbon e. Wiring and taping a flower f. Steps in construction g.	3. Pfahl. The Retail Florist Business, Chapter 33. . PSU. Retail Flower Shop Operation and Management, Problem Area 3. . PSU. Slide Series. Designing With Flowers and Decorative Materials. . ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
4. Construct a typical funeral basket which would be acceptable by the industry.	4. Observe a demonstration of and/or prepare a typical funeral basket.
a. List at least five types of commonly used containers.	. ....
b. List and identify at least five types of flowers frequently used for funeral baskets.	
c. List and identify at least five types of foliages frequently used by florists for funeral baskets.	
d.	
5. Construct a funeral spray which would be acceptable to the florist industry.	5. Observe demonstrations of and/or practice preparing funeral sprays.
a. Diagram at least one basic funeral spray design.	. Visit a local florist and observe the construction of a typical funeral spray.
b. List and identify at least five foliages and five flowers commonly used by the trade in constructing funeral sprays.	. ....
c. List at least two holding devices frequently used for the funeral spray.	
d. List the major steps involved in the construction of a typical funeral spray.	
e.	

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

TOPICS	RESOURCES
4. Constructing a funeral basket a. Types of containers b. Types of flowers c. Types of foliages d.	4. Pfahl. The Retail Florist Business, Chapter 32. . PSU. Retail Flower Shop Operation and Management, Problem Area 3. . PSU. Slide Series. "Designing With Flowers and Decorative Materials." . ....
5. Constructing a funeral spray a. Basic designs b. Foliages and flowers used c. Holding devices d. Steps in construction e.	5. Pfahl. The Retail Florist Business, Chapter 32. . PSU. Retail Flower Shop Operation and Management, Problem Area 3. . PSU. Slide Series. "Designing With Flowers and Decorative Materials." . ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
6. Decorate a typical flowering pot plant in a manner acceptable by the industry.	6. Observe a demonstration of and/or practice wrapping and decorating a typical pot plant.
7. Plan a recommended storage program for a typical supply of cut flowers or pot plants, e.g., a supply of poinsettias at Christmas or a supply of Easter lilies at Easter. a. Prepare a recommended temperature schedule. b. Prepare a recommended relative humidity schedule. c. Prepare a recommended watering schedule. d.	7. As a class or small group project, plan a storage program for a typical florist crop or plant. For example, poinsettias are usually bought in large quantities for sale at Christmas. They must be stored in large rooms, store attics, rental warehouses, etc. The temperature, humidity and light must be carefully controlled during these several weeks. . Visit the storage facilities of a local florist and observe the temperature, light and humidity schedule for crop during storage. . ....
II.	

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

TOPICS	RESOURCES
6. Decorating a flowering pot plant	6. PSU. *Retail Flower Shop Operation,* p. 103.
7. Planning a storage program for a selected crop	7. Pfahl. *The Retail Florist Business*, Chapter 23. . ....
a. Temperature schedule b. Relative humidity schedule c. Watering schedule d.	
II.	

RESOURCES

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Retail Flower Shop Operation and Management

BOOKS

Pfahl, Peter B. The Retail Florist Business, Danville, ILL: The Interstate Printers and Publishers, Inc., 1968.

FILMS AND FILMSTRIPS

The Pennsylvania State University, Department of Agricultural Education, University Park, PA 16802.

"Designing With Flowers and Decorative Materials"

STUDENT HANDBOOKS/TEACHER GUIDES

The Pennsylvania State University, Department of Agricultural Education, University Park, PA 16802.

Retail Flower Shop Operation and Management-A Student Handbook

Retail Flower Shop Operation and Management-A Teacher's Guide

TRANSPARENCIES

MAGAZINES

Southern Florist
Southern Florist Publishers
P. O. Box 1808
Fort Worth, Texas 76101

UNIT: Flower Shop and Garden Center Operation and Management

SUB-UNIT: Garden Center Operation and Management

OBJECTIVE(S): The student will be able to:

I. Plan the operation and management of a selected or typical garden center.

   A. Select a recommended stock inventory for a typical garden center.

   B. Diagram the layout of a typical garden center including the main store, storage buildings and grounds.

   C. Prepare a seasonal schedule of major sales for a typical garden center.

   D. Wait on a customer in a manner acceptable to the industry.

   E. Prepare an advertisement program for a typical garden center which would be acceptable to the industry.

   F. Plan a recommended maintenance program for ornamental plants displayed and sold by the typical garden center.

   G. ....

II. ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Plan the operation and management of a selected or typical garden center.	I. As a class or small group project, plan the operation and management of a selected or typical garden center. . Invite a local garden center operator to visit the class or interview such a person at a garden center. . Visit a local garden center. . ....
A. Select a stock inventory for a typical garden center.	A. As a class or small group project, visit a local garden center(s) and do a cursory inventory of stock.
1. List the major types of stock carried by a typical garden center, e.g., ornamental plants, plants, seeds, chemicals, equipment, hardware, etc.	. ....
a. List the major types of landscape plants carried, e.g., small trees, shrubs, ground covers, vines, bedding plants, etc.	a. As a small group or individual project, inventory the major types of landscape plants stocked by a local garden center(s).

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

TOPICS	RESOURCES
I. Planning the operation and management of the garden center A. Selecting the stock 1. Types of stock . Ornamental plants . Seeds . Chemicals . Fertilizers . Pesticides . .... . Equipment . Garden tractors . Rotary tillers . .... . Hardware . Tools . Fittings	I. Wash/Joy/Hoover. *Selling Farm and Garden Supplies*. . Local garden center operators and managers . Pinney, *Operating a Garden Center*. . ....
a. Types of ornamental plants . Trees . Shrubs . Bedding plants . Ground covers	a. Local garden center operators and managers . Local nurserymen . Pinney, *Operating a Garden Center*. . ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
b. List the major types of chemicals typically stocked, e.g., fertilizers, pesticides, etc.	b. As a small group or individual project, inventory the types of chemicals typically stocked by a local garden center(s).
c. List the major types of equipment carried, e.g., small garden tractors, rotary tillers, etc.	c. As a small group or individual project, inventory the types of equipment stocked by local garden centers.
d. List the major types of hardware and tools stocked, e.g., hoes, garden hoses, rakes, etc.	d. As a small group or individual project, inventory the types of hardware stocked by local garden centers.
e.	e. ....
2. List the approximate amount and value of each of the items stocked.	. While performing the cursory inventory suggested in the preceding activity, determine the approximate value of each inventory of stock.
3.	. ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

TOPICS	RESOURCES
b. Types of chemicals . Fertilizers . Complete . Topdress . .... . Pesticides . Insecticides . Herbicides . Disease control	b. Local garden center operators or managers . Fertilizer company representatives . Pinney, Garden Center Operation. . ....
c. Types of equipment . Garden tractors . Rotary tillers . Hedge trimmers . Lawn mowers	c. Local garden center operators or managers . Equipment company sales representatives . Pinney, Garden Center Operation. . ....
d. Types of hardware . Tools . Rakes . Hoes . .... . Fittings . Bolts . Nails	d. Local garden center operators or managers . Hardware sales representatives . Pinney, Garden Center Operation. . ....
e.	e. ....
2. Value of inventory	
3.	

OBJECTIVES	LEARNING ACTIVITIES
B. Diagram the layout of a typical garden center including the main store, storage buildings and grounds.	B. As a class or small group project, prepare a diagram showing the layout of local or typical garden centers.
1. List the major facilities typically used by a garden center.	. ....
2. List the major items of equipment found in a typical garden center.	
3. List the major ground areas typically found.	
4.	
C. Prepare a seasonal schedule of the major sales events, e.g., spring - bedding plants, azaleas, seed, summer - lawn equipment, fall - Halloween decorations, winter - Christmas decorations, trees, shrubs, etc., for a typical garden center.	C. As a class project and with the help of a local garden center operator, prepare a seasonal schedule of major sales.

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

TOPICS	RESOURCES
B. Laying out the garden center 1. Facilities 2. Equipment 3. Ground areas 4.	B. Local garden center operators, owners or managers . Pinney, Garden Center Operation.
C. Preparing a seasonal sales schedule . Spring . Bedding plants . . Azaleas . Seed . .... . Summer . Lawn equipment . .... . Fall . Halloween decorations . .... . Winter . Christmas trees and decorations . Trees . Shrubs	C. Local garden center operators or managers . Pinney, Garden Center Operation.

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
D. Wait on a customer in a manner acceptable to the industry.	D. Seek occupational work experience as a salesperson in a local garden center.
1. Provide a customer with adequate knowledge about a given product either by personal knowledge or by providing the customer with adequate written information, e.g., information sheets, brochures, product labels, etc.	1. Simulate customer and salesperson.
a. Identify at least five of each of the following types of plants sold: (1) trees, shrubs, bedding plants, ground covers.	a. Conduct an identification contest in a local garden center plant department. . ....
b. With the use of appropriate references, provide the customer with recommended uses, climatic adaptations, planting dates, planting depths, etc., for the major plants sold.	b. Obtain, use and file a reference which provides recommended uses, climatic adaptations, planting dates, planting depths, etc., for the major plants sold.
c. Identify the major tools sold.	c. Conduct an identification contest in the tool department of a local garden center.
d. Adjust and demonstrate the safe operation of the major pieces of equipment sold.	d. Observe demonstrations of and practice the safe operation of the major types of equipment sold.
e. When given appropriate charts or references, select a recommended insecticide for the more common insects which attack ornamental plants.	e. Observe demonstrations of and practice using insecticide charts or other references to provide the customer with insect control information.

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

TOPICS	RESOURCES
D. Waiting on a customer	D. Ernest. Basic Salesmanship.
1. Providing product knowledge	. Walsh/Joy/Hoover. Selling Farm and Garden Supplies. . ....
a. Identifying plants	. Symonds/Barrows. The Shrub Identification Book. . Symonds/Barrows. The Tree Identification Book.
b. Providing product knowledge about ornamental plants	. Robinson. Useful Trees and Shrubs.
c. Identifying tools	. Interstate Printers and Publishers. Tool Identification Kit.
d. Demonstrating equipment	. Manufacturer's or owner's manuals.
e. Providing the customer with insect control information	. Clemson University Cooperative Extension Service. . Agricultural Chemical Handbook . Insect and Disease Identification Sheets - CE Series 1-28.

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
f. When given appropriate references or charts, select a recommended disease control chemical for a select plant disease.	f. Observe demonstrations of and practice using disease control information charts or references to select recommended plant disease control.
g. When given appropriate references or charts, select a recommended herbicide for a given grass or weed.	g. Observe demonstrations of and practice using herbicide charts or references to provide information on weed control.
h. When given appropriate references or charts, advise a customer as to recommended seed varieties, planting times, depths and distances.	h. Observe demonstrations of and practice using seed charts or other references to provide customers with recommended seed varieties, planting times, planting depths, planting distances, etc.
i.	i. ....
2. Greet a customer in a manner acceptable to the industry.	2. Observe demonstrations of and practice greeting customers in an acceptable manner.
a. List at least three factors to consider in greeting a customer. b.	. Critique greetings provided by salesperso and analyze these greetings in terms of content.
3. Fill out a typical sales slip in a manner acceptable to the industry.	3. Observe demonstrations of and practice filling out a sales slip.
4. Operate a typical cash register used in a garden center in a manner acceptable to the industry.	4. Observe demonstrations of and practice operating a typical cash register.
5.	5. ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

TOPICS	RESOURCES
f. Providing the customer with plant disease control information	f. Clemson University Cooperative Extension Service. . Agricultural Chemical Handbook . Insect and Disease Identification Sheets - CE Series 1-28
g. Providing the customer with herbicide information	g. Clemson University Cooperative Extension Service. . Agricultural Chemical Handbook
h. Providing the customer with information about seed	h. Seed dealer guides or charts.
i.	i. ....
2. Greeting the customer	. Walsh/Joy/Hoover. Selling Farm and Garden Supplies. . Ernest. Basic Salesmanship. . ....
3. Filling out a sales slip	
4. Operating a cash register	
5.	

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
E. Prepare an advertisement program for a typical garden center which would be acceptable to the industry.	E. As a class or small group project, prepare an advertisement plan for a typical garden center.
1. Prepare a newspaper ad for a selected product which would be acceptable to industry.	1. Collect and critique local newspaper ads. . Practice preparing newspaper ads to promote the sales of various products.
2. Prepare a sales display for a selected product which would be acceptable to the industry.	2. Critique the sales displays in local garden centers. . As a class or small group project, prepare a sales display for a selected product(s). . ....
3.	3. ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

TOPICS	RESOURCES
E. Preparing an advertisement program	E. Antrim. Advertising.
1. Preparing a newspaper ad	. Walsh/Joy/Hoover. Selling Farm and Garden Supplies.
	. ....
2. Preparing a sales display	
3.	

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

OBJECTIVES	LEARNING ACTIVITIES
F. Plan a recommended maintenance program for ornamental plants displayed and sold by the typical garden center.	F. As a class or small group project, plan a maintenance program for a given ornamental plant displayed and sold by the typical garden center.
1. List and/or cite a reference which gives the environmental requirements for a given or selected house plant while being held for sale.	1. Obtain, use and file references which provide environmental requirements of a given or selected house plant(s).
2. List and/or cite a reference which lists the environmental requirements of a given or selected shrub while being held for sale.	2. Obtain, use and file references which provide recommendations for maintaining shrubs.
3. List and/or cite a reference which lists the environmental requirements (temperature, humidity, light) of a given or selected tree.	3. Obtain, use and file references which provide recommended practices for maintaining trees.
4. List and/or cite a reference which lists the environmental requirements (temperature, humidity, light) of a given or selected bedding plant or ground cover plant.	4. Obtain, use and file references which provide recommended practices for maintaining bedding plants or ground cover plants.
5. Determine when a selected ornamental plant needs watering.	5. Observe demonstrations of and practice determining the need for watering ornamental plants.
6. Water a selected or given ornamental plant in a manner acceptable to the industry.	6. Observe demonstrations of and practice watering ornamental plants.
7.	7. ....
G.	G. ....
II.	II. ....

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

TOPICS	RESOURCES
F. Preparing a maintenance program for ornamental plants	F. PSU. *Landscape Maintenance and Establishment*. . Local garden center operators or managers. . .....
1. References which give recommendations for maintaining house plants .	
2. References which give recommendations for maintaining shrubs	
3. References which give recommendations for maintaining trees	
4. References which give recommendations for maintaining bedding plants and ground cover plants	
5. Determining the need for watering plants	
6. Watering plants	
7.	
G.	G. ....
II.	II. ....

RESOURCES

UNIT: Flower Shop and Garden Center Operation and Management
SUB-UNIT: Garden Center Operation and Management

BOOKS

Antrim, William H. Advertising. NY: Gregg Division/McGraw-Hill Book Co., Inc., 1970.

Ernest, John W. Basic Salesmanship. NY: Gregg Division/McGraw-Hill Book Co., Inc., 1969.

Robinson, Florence B. Useful Trees and Shrubs. Champaign, ILL: Garrad Publishing Co., 1960.

Symonds, George W. The Shrub Identification Book. NY: M. Borrows and Co., 1958.

Symonds, George W. The Tree Identification Book. NY: M. Borrows and Company, 1958.

Smith, Cary R. Display and Promotion, NY: Gregg Division/McGraw Hill, Inc., 1970.

Walsh, L.A.; Joy, R.D. and Hoover, N.K. Selling Farm and Garden Supplies. NY: Gregg Division/McGraw-Hill Book Company, 1971.

BOOKS

Pinney, John J. Operating a Garden Center. Washington, D. C.: American Association of Nurserymen, Inc.

STUDENT HANDBOOKS - TEACHER'S GUIDES

The Pennsylvania State University, Department of Agricultural Education, University Park, PA 16802.

Landscape Maintenance and Establishment - A Student Handbook
Landscape Maintenance and Establishment - A Teacher's Guide

BULLETINS

Clemson University Cooperative Extension Service, Clemson University, Clemson, S.C. 29631.

Agricultural Chemical Handbook
Insect and Disease Identification Sheets - CE Series 1-28

UNIT: Basic Selling

SUB-UNIT:

OBJECTIVE(S): The student will be able to:

I. Plan a sales program for a typical horticultural business.

II. ....

UNIT: Basic Selling
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
1. Plan a sales program for a typical horticultural business.	1. As a class or small group project, plan an advertising program for a hypothetical or actual horticultural business.
A. Plan an advertising program for a typical and/or actual garden center or flower shop.	. Interview the local florist or nurseryman to determine the advertising program used.
1. When given several newspaper ads ranging from very good to very poor, rank them accordingly.	. As a small group or individual project, prepare radio ads, newspaper ads or TV commercials and present them to the class.
2. When given several radio and/or TV commercials dealing with flowers or plants which range from good to poor, rank them accordingly.	. Obtain catalogs of ads, TV commercials and other promotional materials available from horticultural product manufacturers.
3. List at least 3 criteria for evaluating a given type of advertisement.	. ....
B. Plan a product and/or window display for a given or typical flower shop or garden center.	. As a class or small group project, plan an equipment and/or show room display for a horticultural business.
1. When shown pictures of three products and/or show window displays, rank them in order of effectiveness.	. While visiting local florist or garden centers, observe the products and/or show window displays.
2. List at least five criteria used in evaluating a product display.	. Obtain equipment and show room display suggestions from the major florist products manufacturers.
3.	

UNIT: Basic Selling
SUB-UNIT:

TOPICS	RESOURCES
I. Planning sales promotion	I.
A. Advertising program . Newspaper ads . TV commercials	A. Pfahl. The Retail Florist Business, Chapter 15. . Rouse and Nolan. Fundamentals of Advertising. . Local agribusiness salesmen . Sales promotion division of horticultural products manufacturers . ....
B. Product display . Showroom displays . Yard displays	B. Pfahl. The Retail Florist Business, Chapter 7 & 8. . Robinson, Blacker and Logan. Store Salesmanship . Wingate and Nolan. Fundamentals of Selling. . Sales promotion division of horticultural products manufacturers . ....

UNIT: Basic Selling
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
C. Plan a sales approach for selling a typical and/or given type of agricultural product.	
1. List at least five criteria for evaluating a sales approach.	
2. List the five steps used in a typical sales approach.	. Observe demonstrations of person-to-person sales techniques.
3. When given demonstrations of sales approaches, select and label those selected as appropriate by an experienced salesperson.	. As a class project, pair up students and have one student role play the part of the salesperson while the other plays the role of customer.
4. List at least five recommended items to check before meeting the customer.	. Analyze sales approaches according to a five step technique (see reference for five steps).
5. When given demonstrations of customer greetings, select and label those selected as appropriate by an authority on the subject, e.g., book, instructor, experienced sales person, etc.	. Observe demonstrations of and/or simulate an appropriate sales greeting. Have the class critique the demonstrations.
a. List at least five criteria to use in evaluating a customer greeting.	
b. List at least five recommended things to do when greeting a customer.	
c.	
6. When given demonstrations of the presentation of products to a customer, select and label those selected as appropriate by an authority.	. Observe demonstrations of and/or simulate the presentation of products to a customer. Have the class critique the demonstration.

UNIT: Basic Selling
SUB-UNIT:

TOPICS	RESOURCES
C. Planning the sales approach	C. 1-6 Pfahl. The Retail Florist Business, Chapter 17.
1. Criteria for evaluation	
2. Steps in making a sales	. Robinson, Blacker and Logan. Store Salesmanship, Chapters 1 and 2.
3. Sales approach	. Wingate and Nolan. Fundamentals of Selling, Chapters 13 and 14.
4. Presales preparation	
5. Greeting the customer	
. Criteria for evaluating a sales greeting	
. Major points to consider when greeting customer	
. ....	
6. Presenting the product	. Robinson, Blacker and Logan. Store Salesmanship, Chapter 3. . Wingate and Nolan. Fundamentals of Selling, Chapter 16. . Local horticultural salesmen

UNIT: Basic Selling

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
a. List at least five criteria for evaluating the presentation of products to a customer.	
b. List at least three means of relating a product to the needs of a customer.	
c.	
7. When given demonstrations of overcoming sales resistance, select and label those selected as appropriate by an authority.	. Observe demonstrations of and/or simulate overcoming sales resistance. Critique the demonstrations.
a. List at least five criteria for evaluating methods used to overcome the customer's resistance.	. Invite a social studies teacher to discuss the psychology of sales.
b. List the five items of sales resistance about which the customer must make a decision.	
c.	
8. When given demonstrations of closing a sale, select and label those chosen as appropriate by an authority.	. Observe demonstrations of and/or simulate the closing of a sale. Have the class critique the demonstrations.
a. List at least five criteria for evaluating a sales closing.	
b. List at least five recommended steps to closing a sale.	
c.	
9.	. ....
II.	II. ....

UNIT: Basic Selling

SUB-UNIT:

TOPICS	RESOURCES
a. Criteria for evaluating presentation	
b. Means of relating product to need	
c.	
7. Overcoming sales resistance	7. Pfahl. The Retail Florist Business, Chapter 17.
a. Criteria for evaluating salesman performance	. Robinson, Blacker and Logan. Store Salesmanship, Chapter 4.
b. Types of sales resistance	. Wingate and Nolan. Fundamentals of Selling, Chapter 17.
	. Local retail florist or garden center operators
c.	. ....
8. Closing a sales	8. Pfahl. The Retail Florist Business, Chapter 17.
a. Criteria for evaluating a closing sale	. Robinson, Blacker and Logan. Store Salesmanship, Chapters 5, 6 and 7.
b. Steps in closing a sale	. Wingate and Nolan. Fundamentals of Selling, Chapter 18.
c.	. Local retail florist or garden center operators.
	. ....
9.	9. ....
II.	II. ....

RESOURCES

UNIT: Basic Selling
SUB-UNIT:

BOOKS

Robinson, Blacker and Logan. Store Salesmanship. Englewood Cliffs, NJ: Prentice Hall, Inc. 5th edition.

Rouse and Nolan. Fundamentals of Advertising. Cincinnati, Ohio: Southwestern Publishing Company, 6th edition.

Wingate, J.W. and Nolan, C.A. Fundamentals of Selling. Cincinnati, Ohio: Southwestern Publishing Company, 7th edition, 1974.

Pfahl, Peter B. The Retail Florist Business. Danville, Ill: The Interstate Printers and Publishers, Inc.

FILMS AND FILMSTRIPS

BULLETINS

TRANSPARENCIES

UNIT: Retail Flower Shop and Garden Center Operation

SUB-UNIT: Exploring Career Opportunities

OBJECTIVE(S): The student will be able to:

I. Compare and contrast the career opportunities in flower shop or garden center operations.

II. List some of the ways in which a career in this area complements or fails to complement life goals.

III. ....

UNIT: Retail Flower Shop or Garden Center Operation
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to:	
I. Compare and contrast the career opportunities related to retail flower shop or garden center operations.	I. Interview people employed in careers related to retail flower shop or garden center operations.
A. List the major career opportunities related to retail flower shop or garden center operations.	. Prepare an in-depth report on at least two occupations related to retail flower shop or garden center operations which are of special interest.
B. Classify the career opportunities as to occupational levels, i.e., professional, technical, etc.	. Perform and/or observe some of the more typical tasks encountered by people employed in the jobs which are of greatest interest to you.
C. List the major competencies required for at least one career related to each of the major occupational areas.	. Arrange to spend an afternoon or full day with a person employed in one of these businesses.
D. List the major activities performed by a person employed in at least one occupation associated with each of the major occupational areas.	. Seek occupational work experience in a retail flower shop or garden center.
E. List the educational requirements of at least one job in each of the major occupational areas.	. If the occupation of your choice requires further schooling, investigate, with the help of your guidance counselor or teacher, the availability of such a school.
F.	

UNIT: Retail Flower Shop or Garden Center Operation
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
I. Career opportunities in or related to retail flower shop or garden center operations. A. Careers . Store Owner . Store Manager . Floral Designer . Sales Person . Bookkeeper . .... B. Occupational classification . Owner . Manager . Worker . .... C. Competencies needed D. Training needed E.	I. Local people employed in retail flower shop or garden center operations. . Hoover. Handbook of Agricultural Occupations, Chapter XI. . PSU. Retail Flowershop Operation and Management. . Society of American Florist. Suite H-220, Sheraton Park Hotel, Washington, D. C. 20008 . ....

UNIT: Retail Flower Shop or Garden Center Operation
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
II. List some of the ways in which a chosen career in this area complements or fails to complement life goals.	II. Participate in a class debate of life goals.
A. List the ways in which a chosen career benefits society.	. Prepare a short paper concerning the ways in which a chosen career complements or fails to complement life goals.
B. List the ways in which a chosen career might benefit the student.	. Sponsor a retail floral day at school or sponsor a special school activity where students would actually set up a mini-floral shop and operate it for one day. This could tie in with other environmental activities of the school and the community.
C.	. ....
III.	III. ....

UNIT: Retail Flower Shop or Garden Center Operation
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
II. Career benefits	II. Hoover. Handbook of Agricultural Occupations, Chapter XI.
A. Benefits to society	
B. Benefits to the individual	
C.	
III.	III. ....

RESOURCES

UNIT: Retail Flower Shop or Garden Center Operation
SUB-UNIT: Exploring Career Opportunities

BOOKS

Hoover, Norman K. Handbook of Agricultural Occupations. Danville, ILL: The Interstate Printers and Publishers, Inc., 2nd edition, 1969.

FILMS AND FILMSTRIPS

STUDENT HANDBOOKS AND TEACHER GUIDES

The Pennsylvania State University, Department of Agricultural Education, University Park, PA: 18602.

Retail Flowershop Operation and Management

TRANSPARENCIES

APPENDIX A

EQUIPMENT LIST
ORNAMENTAL HORTICULTURE and TURF AND LAWN MANAGEMENT

Items with one asterisk (*) are for Turf and Lawn Management only. Items with two asterisks (**) are for Ornamental Horticulture only. If an item has no asterisk by it, it is recommended for both programs.

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
1	Tractor	30-40 HP, industrial model, 3 pt. hitch, gasoline	$6,500.00	$6,500.00
1 ea.	Disc Harrow	20 disc harrow	700.00	700.00
1 ea.	Drag Harrow	8' wide	250.00	250.00
1 ea.	Scrape Blade	6' long utility	130.00	130.00
1 ea.	Loader	Front-end	1,600.00	1,600.00
1 ea.	Seeder-Fertilizer Spreader	700 lb. capacity	375.00	375.00
1 ea.	*Mower	Flail-type 6'	1,000.00	1,000.00
1 ea.	Mower	Bush Hog	700.00	700.00
1 ea.	Post Hole Digger	9" auger	400.00	400.00
1	Roto Tiller	5 HP Roto Tiller (Tractor)	310.00	310.00
2	Wheelbarrow	General purpose steel (4 cu. ft. cap.)	45.00	90.00

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
1	Shredder	½ HP Soil Shredder (electric motor)	251.90	251.90
1	**Sterilizer	Soil sterilizer (12½ amp. 120V), 24 hr. capacity, approx. 1 yard	225.00	225.00
1	Sprayer	20 gallon power sprayer with porcelainized tank and 15' hose	277.65	277.65
1	Sprayer	3 gallon, hand, compression rust resistant	19.95	19.95
1	Duster	Garden, aluminum	46.20	46.20
1	Lawn Roller	24" diameter x 30" long, water-filled	47.00	47.00
6	Respirator	Dust	3.08	18.48
6	Respirator	Spray	4.12	24.72
1	Seeder	Cyclone, centrifugal	29.50	29.50
1	Seeder	Drop-type (3-4')	25.08	25.08
6	**Grafting Knives	Grafting and budding	8.25	49.50
4	**Saws	14" pruning	4.35	17.40
2	**Pole Pruner	18' pole pruning saw	18.70	36.60
12	**Pruning Shears	Hand pruner	6.55	78.60
6	**Pruning Shears	26" lopper	9.90	59.40
6	**Pruning Shears	Long-handled 21" hedge shear	8.57	51.42
6	Hoes	Garden hoe	4.95	29.70

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
4	Shovels	Straight neck, round point	5.94	23.76
3	Shovels	D-handle, square point, 10"	9.02	27.06
3	Shovels	D-handle, normal point	9.02	27.06
4	**Shovels	D-handle, long blade with steel strap (transplanting)	20.30	81.20
12	**Trowel	Transplanting	1.48	17.76
12	**Cultivators	Hand cultivator, 3 curved prongs with 12" handle	2.06	24.72
4	Rakes	Garden rake	5.22	20.88
4	Rakes	Lawn and leaf	4.05	16.20
2	Rakes	Lawn and grading (30" wide)	14.30	28.60
1	Rake	Thatching rake	5.60	5.60
2	Sod Edger	Round blade with 4' handle	5.20	10.40
1	Sod Tamper	8" x 8" with 4' handle	14.70	14.70
1	**Bulb planter	D-handle with foot rests	3.69	3.69
1	Soil Auger	42" long, 6" bit	20.85	20.85
2	Axes	3½" single bit	5.59	11.18
1	Power Saw	Chain saw with bow blade	350.00	350.00
2	Mattocks	5 lb.	5.77	11.54

QUANTITY	ITEM	DESCRIPTION		UNIT COST	TOTAL COST
4	Forks	6 tine manure fork with 4½' handle		8.50	34.00
2	Diggers	Post hole digger		7.80	15.60
1	Kit	Soil testing (Sudbury)		55.50	55.50
1	**Trimmer	Electric hedge		35.00	35.00
1	Reel	Truck hose reel for garden hose		21.32	21.32
4	Hangers	Garden hose hangers		1.00	4.00
2	**Openers	Can opener		1.10	2.20
15	**Snips	Can snips to open side of can		4.34	65.10
1	**Opener	Multiple can punch for opening drain holes in nursery cans		89.90	89.90
20	Drawing Sets	Mechanical drawing set to contain the following:			
	1 ea.	24" x 36" metal edge drawing board	15.84		
	1 ea.	36" lucite edge, maple T-square	6.96		
	1 ea.	12" boxwood architect's scale	3.05		
	1 ea.	30 x 60° acrylic triangle (10")	.60		
	1 ea.	45 x 90° acrylic triangle (8")	.60		
	1 ea.	12" French curve	.65		
	1 ea.	Sandpaper pencil pointer	.30		
	1 ea.	6" protractor	2.80		
	2 ea.	Drawing pencil (4 H) @ .15 ea.	.30		
	2 ea.	Gum erasers @ .12 ea.	.24		
	1 ea.	Erasing shield	.36		
	1 ea.	Dry clean pad	1.02		
	2 ea.	Drafting tape 3/4" x 40' @ 1.86 ea.	3.72		
				36.44	728.80
4	Garden Hoses	3/4" x 25' length		9.90	39.60

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
4	**Electric Cables	Heating cables for hot beds, 50' length	7.53	30.12
4	**Lamps	Gro-lux lamps, 4' long	48.00	192.00
2	Brush Hook	Double edge	9.07	18.14
1	Saw	30" bow	4.23	4.23
4	**Cruiser Sticks	Biltmore-Cruiser, 37"	5.95	23.80
2	**Increment Borer	11" bore	78.70	157.40
1	**Psychrometer	Sling psychrometer (tests relative humidity)	15.67	15.67
1	Thermometer	Soil thermometer	10.78	10.78
1	Hand Level	Hand sighting level	66.00	66.00
1	**Proportioner	Automatic fertilizer proportioner	109.40	109.40
20	**Kits	Plan 'n Plant Landscape 3D Kit	6.00	120.00
1	Mower	21" rotary mower	100.00	100.00
1	Mower	21" reel mower	147.00	147.00
1	*Mower	3 gang fairway mower	1,865.00	1,865.00
1	*Mower	Greens mower with air cooled engine, electric starter (60" cutting width)	710.00	710.00
1	*Top Dresser	40" spreading width	1,580.00	1,580.00
1	*Mat	Drag mat	130.00	130.00

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
1	*Verticutter	Thatch control, power rake	325.00	325.00
1	*Aerator	Fine turf aerator for golf greens	1,670.00	1,670.00
1	*Spiker	Power disc spiker for golf greens	780.00	780.00
1	*Edger	Power lawn edger	100.00	100.00
1	*Whipping Pole	8' fiberglas rod for whipping dew	17.00	17.00
1	*Hole Cutter	Foot ejector hole cutter for cups (6" scalloped cut)	28.00	28.00
1	*Sod Cutter	12" wide x 2½" cut	890.00	890.00
2	*Rakes	Sand trap rake, 36" wide	15.00	30.00
1	*Grinder	Lawn mower precision (1 man unit) grinder (for reel blades)	845.00	845.00
1	*Lapper	Modern lapping machine for reel blades	130.00	130.00
1	Plugger	Turf plugger, 2¼" diameter core to 2 3/8" depth, 32" handle	22.00	22.00
1	*Sweeper	36" swath, pull type (pick up clippings)	250.00	250.00
1	Shredder	Leaf shredder, 5 HP gasoline	300.00	300.00
1	*Kit	Irrigation kit for golf courses (Toro from E.J. Smith & Sons Co.)	2,500.00	2,500.00
2	Benches	Work, 2 man	176.00	352.00

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
1	Cleaner	Steam, Jenny IIC or equiv.	625.00	625.00
1	Compressor	Air, 40-100 psi, 12 gallon tank, 1 cylinder, 3/4 HP motor	240.20	240.20
1	Grinder	General purpose bench, ½ HP	192.50	192.50
1	Hoist	Chain, 2 ton capacity	328.90	328.90
1	Monorail	2 ton capacity	68.00	68.00
1	Welder	Arc, 200V, 20% duty cycle	212.52	212.52
1	Welder	Oxyacetylene, medium duty	140.00	140.00
1	Brace	Ratchet, 10" Swing	10.76	10.76
1 set	Bits	Auger, ¼" - 1" (by 1/8's)	28.00	28.00
1	Bit	Countersink, rose head - 3/4" x 5"	1.32	1.32
1 set	Chisels	Wood, heavy duty, ¼" - 1" (by ¼'s)	9.19	9.19
1	Drawknife	10" blade	6.00	6.00
1	Bar	Wrecking, gooseneck, 18"	.72	.72
1	Plane	Smoothing plane, 9"	6.60	6.60
2	Saws	Hand, rip, 5½ pt. 26"	8.30	16.60
1	Saw	Coping, 6½" blade	1.82	1.82
1	Saw	Keyhold (10 points)	2.20	2.20
1	Square	Framing, 16" x 24"	11.08	11.08

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
1	Square	Sliding, T-bevel 10"	3.12	3.12
1	Square	Combination, 12"	4.95	4.95
1 set	Screwdriver	Set of Bits, 1/4", 5/16", 3/8"	3.23	3.23
1 set	Screwdriver	Phillips, 6", 8", 10"	3.23	3.23
1 set	File	Mill files, 6", 8", 10"	3.80	3.80
1	File	Wood rasp, 12"	5.61	5.61
1	Scraper	Wood, 3" blade	5.63	5.63
1	Oilstone	Combination, 6" x 2"	42.85	42.85
1	Mallet	Carpenter's, 16 oz.	2.53	2.53
1	Knife	Putty	1.27	1.27
1 set	Bits	Expansion, 7/8" - 3"	8.47	8.47
2	Clamps	Adjustable bar, 3' - 8'	5.06	10.12
2	Clamps	"C" clamps, 5"	7.65	15.30
2	Hammers	16 oz., curved claw	4.80	9.60
1	Saw	Miter saw, 10 points	17.49	17.49
2	Tapes	Return tape, 12'	5.17	10.34
2	Rules	Extension rule, 6'	5.00	10.00
2	Tapes	Steel tape, 100'	13.20	26.40
2	Bobs	Plumb bob, 12 oz.	3.80	7.60

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
1	Level	Carpenter's level, 18" and 24"	8.20	8.20
2	Chalkline	Self-chalking, 50'	2.75	5.50
2	Files	Bastard, flat (1 ea. of 8" and 10")	1.65	3.30
2	Files	Bastard, round, 8" and 10"	1.65	3.30
2	Files	Slim taper, 6"	.77	1.54
12	Files	File handles, assorted sizes	.50	6.00
3	Brush	Paint brush (1 ea. of 2", 3", 4")	4.55	13.65
2	Cutter	Glass cutter	.83	1.66
2	Brushes	Wire brushes, 7¼" x 2 7/8"	1.10	2.20
1	Vise	Woodworking, 4" x 10" jaws, open 12"	37.48	37.48
1	Anvil	Steel, 100 lbs. with stand	120.00	120.00
6	Chisels	Cold, ¼", 3/8", ½", 5/8", 3/4", 1"	1.16	6.96
2	Punches	Center punch, ½" x 6"	1.27	2.54
1 set	Hammer	Ball pein (12, 20, 24 oz.)	11.00	11.00
1	Hammer	Sledge, 6-8 lbs.	10.73	10.73
1 set	Extractor	Screw extractors, Nos. 1-6	3.91	3.91
2	Hammers	Chipping hammer for welder	2.20	4.40
2	Brushes	Welder's brush, 10" handle	.72	1.44

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
2 pair	Gloves	Welding gloves, leather	4.73	9.46
4	Goggles	Chipping and grinding, cup type	3.96	17.84
4	Goggles	Welding, cup type	3.74	14.96
4	Helmets	Welding helmet	15.07	60.28
1	Torch	Propane, tips and tank	9.40	9.40
1	Snips	Tinners snips, straight	3.90	3.90
1	Soldering iron	Electric, removable tips, 300 watts	14.85	14.85
1	Rivet Kit	Includes tools and rivets	24.14	24.14
1 set	Pipe Dies	1" - 2"	44.24	44.24
1 set	Pipe Dies	Ratchet type, ¼" - 1"	43.89	43.89
1	Cutter	Pipe, ¼" - 1¼"	21.56	21.56
1	Cutter	Copper tubing, 3/16" - 1 1/8"	3.79	3.79
1	Reamer	Burring bit brace	11.16	11.16
1	Wrench	Pipe wrench, 18"	10.64	10.64
1	Wrench	Pipe wrench, 12"	6.62	6.62
1	Vise	Pipe, 1/8" - 2"	25.63	25.63
1	Pliers	Electrician, side cutting, 7"	4.68	4.68
1	Screwdriver	Electrician, 3"	1.38	1.38
1	Screwdriver	Electrician, 6"	1.74	1.74

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
1	Light	Test light	14.28	14.28
1	Groover	Concrete sidewalk	1.32	1.32
1	Jointer	Concrete sidewalk	2.86	2.86
1	Level	Mason's level, 48" aluminum	21.78	21.78
1	Line	Mason's nylon line, 100'	.88	.88
1	Trowel	Brick, 11"	5.55	5.55
1	Trowel	Pointing trowel, 5"	1.87	1.87
1	Trowel	Cementer's trowel, 11"	5.55	5.55
1 set	Punch	Center punches	6.82	6.82
1 set	Assorted Pliers	needle nose, diagonal channel lock, vise-grip (one each)	11.00	11.00
1 set	Screwdriver	Machines, 6", 8", 10"	7.10	7.10
1 set	Wrench	Socket and box-end combination	22.18	22.18
1 set	Wrench	Allen (hex-head)	1.08	1.08
1 set	Wrench	Spark plug	3.57	3.57
2	Cans	5-gallon	13.80	27.60
2	Cans	1 gallon	10.07	20.14
2	Cans	Oilers, 1/3 - 1/2 pint	.70	1.40
1	Grease Gun	Pressure, lever type, 16 oz.	6.05	6.05

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
1	Light	Timing light	32.39	32.39
1	Charger	Battery charger (6V - 12V)	58.40	58.40
1	Cable	Jumper cables	16.22	16.22
2	Lights	Service light, 25' cord, bulb shield	5.00	10.00
1	Tire Gauge	Heavy duty	3.52	3.52
1 set	Wrench	Drive socket - ½"	75.57	75.57
1 set	Metric Sockets	½" drive	8.50	8.50
1 set	Wrench	Open end, 5/16" - 1" by 16ths	32.93	32.93
1 set	Wrench	Box end, 5/16" - 1" by 16ths	48.24	48.24
1 set	Metric Wrenches	Combination, 6mm to 24mm	28.18	28.18
1	Wrench	Adjustable, 8"	4.56	4.56
1	Wrench	Adjustable, 10"	4.67	4.67
1 set	Wrench	3/8" drive socket with 13/16" deep socket	11.34	11.34
1	Wrench	Torque, 3/8" drive, 0-600 in. lbs.	15.75	15.75
1	Wrench	Briggs & Stratton starter clutch wrench	4.00	4.00
1	Holder	Briggs & Stratton flywheel holder	6.00	6.00
1	Gauge	Spark plug, wire	5.80	5.80
1	Tool	Ignition tool set (small engine)	21.40	21.40

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
1	Tester	Coil tester	69.00	69.00
1	Dresser	Wheel dresser	39.39	39.39
1 set	Drill Bits	High speed 1/16" - 1/2" by 64ths, 1/2" - 1" by 8ths	36.80	36.80
1 set	Drill Bits	Masonry drills, 1/4" - 3/4" by 16ths	18.48	18.48
1	Drill	Portable, electric, 1/4"	64.50	64.50
1	Drill	Portable, electric, 3/4"	84.70	84.70
6 pair	Gloves	Rubber gloves for handling chemicals	1.80	10.80
1	Bottle	Eye-wash bottle	8.50	8.50
1	Kit	First Aid (Industrial model for Mechanics)	31.20	31.20
1	Kit	First Aid (Contractor model for outdoors)	39.10	39.10
2	**Signs	"DANGER - KEEP OUT"	1.69	3.38
1	**Nozzle	Seedling nozzle (mist)	2.95	2.95
1	**Nozzle	Water breaker	2.16	2.16
2	**Extension	Handi-reach hose extensions (1 ea. 36", 48")	3.50	7.00
2	Nozzle	Squeeze handle	2.20	4.40
3	Cutter	Bow-blade hand slings	3.56	10.68

QUANTITY	ITEM	DESCRIPTION	UNIT COST	TOTAL COST
1 set	Funnels	Assorted	10.00	10.00
1	Cabinet	Storage cabinet, fire proof, flammable material (not needed if flammable storage area is provided)	350.00	350.00
1	Fire Extinguisher		21.30	21.30
1	Sprinkler	Oscillating	8.80	8.80
1	Sprinkler	Impulse	12.05	12.05
1 set	*Tee markers	red, white, and blue - 1 ea.	20.00	20.00
1 set	*Golf clubs		200.00	200.00
1	*Golf ball cup	Metal	7.50	7.50
1	*Flag pole & flag	For golf green	20.00	20.00
1	Transit-level	With tripod, plumbob, & rod	150.00	150.00
1	**Refrigerator	For holding cut flowers, cuttings, etc.	150.00	150.00

TOTALS:		
TOTALS:	Ornamental Horticulture	$20,147.47
	Turf and Lawn Management	$31,594.60

NOTE: All equipment must meet "OSHA" Standards. Prices are approximate for August 1974.

APPENDIX B*

SELECTED LIST OF PROFESSIONAL AND TECHNICAL SOCIETIES AND ORGANIZATIONS CONCERNED WITH ORNAMENTAL HORTICULTURE AND ITS APPLICATION

Inclusion or omission of an organization or society in this list does not imply approval or disapproval of it. Additional information regarding local chapters or sections of these organizations or societies may be obtained by writing directly to the executive secretary at the listed address.

American Association of Botanical Gardens and Arboretums, Department of Horticulture, New Mexico University, Box 530, University Park, New Mexico 88070.

American Association of Nurserymen, Inc., 835 Southern Building, 15th and H Streets, NW, Washington, D. C. 20005.

American Forestry Association, 919 17th Street, NW, Washington, D. C. 20006.

American Horticultural Society, Inc., 1600 Bladensburg, Road, NW, Washington, D. C. 20002.

American Institute of Park Executives, Inc., Oglesbay Park, Wheeling, West Virginia 26003.

American Rhododendron Society, 3514 North Russet Street, Portland, Oregon 97200.

American Rose Society, 4048 Roselea Place, Columbus, Ohio 43200.

American Seed Trade Association, Southern Building, Suite 803, 1030 15th Street, NW, Washington, D. C. 20005.

American Society for Horticultural Science, Department of Horticulture, Michigan State University, East Lansing, Michigan 48823.

*This list prepared by the Ohio Career Education and Curriculum Management Laboratory in Agricultural Education for the United States Office of Education. Career Preparation in Ornamental Horticulture. A Curriculum Guide for High School Vocational Agriculture. Columbus, Ohio: The Laboratory for the U. S. Department of Health, Education and Welfare, pp. 259 and 260.

American Society of Landscape Architects, Inc., 2000 K. Street, NW, Washington, D. C. 20006.

Holly Society of America, Inc., P. O. Box 8445, Baltimore, Maryland 21234.

International Plant Propagator's Society, Rutgers the State University, Department of Horticulture, New Brunswick, New Jersey 08903.

International Shade Tree Conference, 1827 Neil Avenue, Columbus, Ohio 43210.

Men's Garden Clubs of America, 50 Eaton Street, Morrisville, New York 13408.

National Arborists Association, P. O. Box 426, Wooster, Ohio 44691.

National Association of Gardeners, Inc., 194 Old Country Road, Mineola, New York 11501.

National Landscape Nurserymen's Association, P. O. Drawer 281, Leesburg, Florida 32748.

National Parks Association, 1300 New Hampshire Avenue, NW, Washington, D. C. 20036.

Society of American Florists, Suite H-220, Sheraton Park Hotel, Washington, D. C. 20008.

Society of American Foresters, Suite 300, 1010 16th Street, NW, Washington, D. C. 20036.

Woman's National Farm and Garden Association, 3017 Military Road, Washington, D. C. 20015.

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University Park PA 16802.
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Designing With Flowers and Decorative Materials
Turfgrass Identification (30 Color Slides)
Types of Turf (17 Color Slides)
Weed Identification (37 Color Slides)

The Vocational Education Media Center, 109 Freeman Hall, Clemson University,
Clemson, S. C. 29631
Horticultural Plants of Importance to Landscape Plans (125 Color Slides)

MAGAZINES:

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STUDENT HANDBOOKS AND TEACHER GUIDES:

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Greenhouse Crop Production - A Student Handbook
Greenhouse Crop Production - A Teacher's Guide
Landscape Design - A Student Handbook
Landscape Design - A Teacher's Guide
Nursery Production and Landscape Maintenance - A Student Handbook
Nursery Production and Landscape Maintenance - A Teacher's Guide
Retail Flowershop Operation and Management
Using the High School Greenhouse

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